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INDUSTRIAL ARTS NUMBER

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A PUBLICATION OF

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EDUCATION

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FOREWORD

ARTHUR B. MAYS
PROFESSOR OF INDUSTRIAL EDUCATION
UNIVERSITY OF ILLINOIS

ECONOMIC and social upheavals are always reflected in the policies and procedures of the schools. The remarkable changes and controversies growing out of the reckless economic and social extravagances of the 1920's and the resultant depression of the early 1930's are now being reflected very definitely in the shifting emphases in educational thought and practice. Whatever the schools of the future may be, they can never again be what they were before 1920. Among the new phenomena in the educational world is a general acceptance of the doctrine that the schools of a democracy must be increasingly democratic in the organization, the spirit, and the substance of both the curriculum and the instruction. A striking aspect of the widespread acceptance of this doctrine is a new interest in and emphasis on the practical arts courses as phases of general education.

As one of the major divisions of the practical arts courses, industrial arts is being developed in the public schools as never before. The long history of significant accomplishment and the growing realization of the soundness of the educational philosophy underlying this feature of the curriculum have greatly accelerated its remarkable expansion in recent years. The growing recognition of industrial arts as a valuable element in the preparation of youth for higher education, as well as an important contribution to training for successful vocational and community life, is another interesting incident in recent educational history.

Few activities of the school are more nearly in harmony with the prevailing doctrines of elementary and secondary education of today. Entering the curriculum in 1880 as a means of bringing the schools of that day into step with the changing economic and social life of a nation newly awakened to a consciousness of world importance, this field of study has ever since endeavored to keep itself under constant self-examination and revision. Its very content and philosophy necessitate its maintaining intimate relationships with the changing life of a growing civilization.

The contributions in this number of EDUCATION are by men who are outstanding in the field of industrial education. Each one was invited to contribute because of important achievements in teaching, administration, or research in this field. The materials presented are therefore submitted by the editors with a feeling of assurance that the reader will be certain to find something of value to him as he tries to acquire a more accurate understanding of this essentially modern aspect of democratic education.

INDUSTRIAL ARTS AS A PART OF THE PROGRAM OF STUDIES OF THE SECONDARY SCHOOL

ARTHUR W. CLEVENGER

HIGH SCHOOL VISITOR, UNIVERSITY OF ILLINOIS, AND
SECRETARY OF THE NORTH CENTRAL ASSOCIATION OF COLLEGES AND
SECONDARY SCHOOLS

This excellent presentation of the significance of industrial arts as a vital part of the secondary school program by Mr. Arthur W. Clevenger will be of great interest to teachers and administrators of the high school. Mr. Clevenger has contributed much to the development of industrial arts in the secondary schools of the North Central Association of Colleges and Secondary Schools.

THE American public high school, built largely on a pattern borrowed from Europe, has remained until within the past few years essentially a college preparatory institution. A program of studies thought to be the best foundation for college work has been well established through a period of several generations and strongly entrenched. There are many who still believe that preparation for college is the best preparation for life. In contrast to the belief and practice of the peoples of most European countries, the American people strongly believe in a policy of an education for every child at public expense. Until recently, however, the public in general has thought little about the kind of an education which should be provided. If a pupil was not interested in the usual college preparatory studies, or found them beyond his understanding, it was an easy matter to quit school and find work. Such a boy or girl usually found a place on the farm or in the factory and the public was well satisfied. The teacher was glad to see an educational problem so easily solved.

The constantly increasing proportion of youth of high school age enrolled in the secondary schools has been mentioned frequently by the press. The public is much concerned about the increasing cost of education. The phenomenal growth of the secondary schools and the educational problems resulting from the continued attendance in high school of a large group of pupils of comparatively low ability, are matters of general discussion among teachers and school administrators. Compulsory attendance laws, child labor laws, and the growing belief among parents that the high school is the best place for their children until they have reached the age when they are acceptable to industry, have resulted in the continuance in school of a very large number of pupils who, because of low ability or lack of interest, are unable to profit greatly from studying those high school subjects long accepted as constituting the necessary foundation for college work.

Only quite recently has there come a general realization on the part of parents and taxpayers that the high school is no longer simply a college preparatory institution, but that it must meet the needs and interests not only of the student who is preparing for college but also of that large group of pupils who never will enter an institution of higher education.

In many of the larger communities

the need for certain kinds of activities and types of training not included in the usual college preparatory program has been felt for many years. Courses in manual training and domestic science were added to the program of studies because there was a feeling that some of the pupils seemed to derive more benefit from an activity involving the use of the hands than they were able to secure from an academic study. Such courses were not generally regarded as having any value as preparation for college and were labeled "Non-academic" subjects. When such subjects as agriculture, music, commercial studies, art, and the newer type courses in home economics and industrial arts were added to the program of studies of the secondary school, they, too, became generally known as "Non-academic" subjects. In some schools they were classified as "Liquids," in order to distinguish them from "Solids," a term used to identify those subjects generally accepted as being college preparatory or academic in character. As the number of high school graduates seeking admission to college increased and as the competition to secure students grew, many institutions of higher education showed a willingness to accept for admission a limited amount of credit in the so-called non-academic subjects, soon known among admission officers and listed in college catalogues as "Class C" subjects. Although the practice still continues in many institutions of higher education, the classification of high school subjects as "Class A," "Class B," and "Class C," or the labeling of them as "Academic" and "Non-academic" is unquestionably a serious mistake because it tends to place a stigma on certain studies and serves no worthy purpose. In this connection, the following statements prepared by F. C. Hood, of the University of Illinois, are worthy of careful study and consideration by those who feel that high school subjects must be classified and labeled:

"An untenable assumption is frequently made in connection with the division of activities into different groups. Activities may be divided into different groups on the basis of certain traits, qualities, characteristics, or purposes which they possess. A source of much confusion is the assumption that each of these traits is necessarily restricted to some particular group of activities. Instead of assuming that an activity is, for instance, either practical or intellectual or social or aesthetic, etc., it should be recognized that one and the same activity may possess each of these qualities.

"One of the most important controversies for educational practice arises over the question of whether two distinct types of education should be set up to correspond to the common classification of all activities into the practical on the one hand and the cultural on the other. Those who would set up these two types of education assume that the nature of productive activities are such that they cannot be made to furnish satisfactory opportunities for the development and exercise of intelligence, social responsibility, and aesthetic sensitivity. A justification for this assumption is sought in an over-emphasis of the extent to which the classification corresponds to present realities. Much work, it must be admitted, is neither enlightening, socially significant, nor aesthetically satisfying to those who engage in it. But the admission should mean merely taking cognizance of an undesirable condition. The admission does not commit us to the position that vocational activities may not through education be so changed that they will to a greater extent possess the qualities called cultural."

If the activities or projects included in an industrial arts course are to have educative value, there are certain conditions which must be met. The first of these conditions is that of interest. In general, those finished projects which become the property of the boy and which can be taken home arouse the greatest interest, although a pupil or a group of pupils may become intensely interested in the completion of some special project for the school. The boy who has a felt need for a study table for his room, a table with drawers and locks, is quite likely to take great pride and interest in making such a project. It is the responsibility of the teacher to select those activities and projects that appeal most to the interests of the pupils.

A second condition is that the activity or project must be worthwhile. It is not enough that the project be regarded by an adult as having intrinsic value. It must appeal to the youth as something which is valuable. The old course of study in manual training was filled with "joints," "butt joints," "lap joints," "mitre joints," and "dove-tails." They were not a part of anything. The condition that the project be considered by the pupils as one possessing value was not met by this succession of "exercises."

A third condition is that the activity involve problems that awaken new curiosity and which create a demand for information.

Before a project is undertaken, it is important that enough skill has been acquired that the pupil can feel sure that its successful completion is within his ability. Where the final goal is a finished project that possesses value, the pupil is usually interested in doing a certain amount of practice which will place him in a position to complete successfully the project which he has selected. The preliminary practice, however, must be shown to have a definite relationship to the work which later must be done skillfully if the quality of the finished project is to be such that it will be satisfying to the pupil. A few years ago a great many boys who had not acquired the necessary skill with tools became emotionally interested in the making of a model coach of the colonial type. The possibility of winning a prize for the best model coach blinded many boys to the fact that they had not yet acquired the skill necessary for the successful completion of such a project. There are still many attics in which may be found the unfinished parts of a model colonial coach. This was unquestionably an excellent project for the boy with mechanical ability who had acquired a high degree of skill in the use of tools, but working on the model coach proved to be very disappointing in the case of those boys who were not yet ready for such a difficult undertaking.

A fifth condition is that the activity or project selected must involve a time span for its execution sufficient to make possible educational development. One step should lead naturally to the next. This condition is not met when an activity is so planned that it involves only the completion of a succession of unrelated acts.

Subjects included in the field of the industrial arts possess an advantage over some of the generally accepted college preparatory studies in that they offer a wide range of possibilities for the selection of projects and

activities that arouse interest and impress the pupil as having value. It is also true that many of the activities and projects which naturally belong to the field of the industrial arts are of such a nature that they can be organized so as to provide for educational development.

Teachers, school administrators and parents no longer question to any great extent the value of industrial arts as a field of study in the high school for those pupils who are not preparing for entrance to college, and especially for those who expect to work in the skilled trades or on farms. There are still many high school teachers, principals, and faculty members of institutions of higher education, however, who feel that college preparatory students are wasting their time in taking industrial arts courses.

There has been much discussion within recent years relative to the college preparatory value of the high school subjects now generally included in the program of studies of the comprehensive high school. Recent studies which have been made of the college records of freshmen seem to indicate that the particular subjects which the student completed in high school are not of as much significance in determining his success in college as the quality of work which he did in the secondary school. A student's rank within his high school graduating class seems to be the most reliable single index of the success which he is likely to have during his freshman year in an institution of higher education. There are no tenable grounds for the assumption that a pupil may not through the mastery of a carefully selected content in the particular subject in which he is interested develop those abilities which will insure success in college. The matter of the particular subject completed in high school seems to have less bearing on the success of the student in his freshman year in college than does the training which he has secured in learning how to study and organize his knowledge.

In preparing for college, it seems reasonable to assume, until there has been a radical change in the organization and content of college courses, that a rather broad general preparation in such fields as English, mathematics, foreign language, science, and social studies constitutes a good foundation for work to be undertaken in an institution of higher education. There appear to be no tenable grounds, however, for the assumption that a college preparatory student should not take in the high school industrial arts courses in which he is interested. Such courses can be organized and taught in such a way that there should be no question as to their educational value. Even though a high school graduate should decide to continue his training by attending an institution of higher education, it is quite likely that skill in the use of tools and the knowledge acquired in an industrial arts course will prove to be a very valuable asset to him as the head of the household and as a member of society.

The preparation and special training of a teacher determine to a very large degree the success which he has in planning industrial arts courses in such a way that they will have educative value. It is highly important that the industrial arts teacher not only be well trained in the particular

branch of the subject taught, but he should have special preparation in such subjects as physics, chemistry, biology, economics, geography, and art.

Many school administrators, high school teachers, and faculty members of institutions of higher education have been recommending the reorganization of industrial arts courses to include a large proportion of what they call "content," namely, that which they believe to have cultural value. Unfortunately, in an attempt to provide content for a course in industrial arts and to give it an academic atmosphere, there has been a noticeable tendency on the part of industrial arts teachers to imitate the methods used by teachers of the academic subjects. This is especially true in those schools where the daily schedule is organized on what is known as the hour-period plan. The shortening of the industrial arts laboratory period unquestionably has placed a serious handicap on certain kinds of worthwhile shop experiences. There has been a tendency for the laboratory period, which should provide opportunity for educational development through participation in activities, to become simply a recitation period modeled after that of an academic subject of former days.

During the period of the past quarter of a century great stress has been placed on the importance of attending college. On account of this pressure, and because of the high esteem with which a college degree has been held, many high school graduates who probably have not profited greatly from college courses, were led to believe that their success in life depended on a college education. The high school boy who had mechanical ability and who wished to prepare for a skilled trade was likely to find himself looked down upon by his classmates. In the skilled trades there are opportunities for young men of high ability. Fortunately, at the present time, there seems to be some tendency for society to elevate to a higher plane the position which the skilled tradesman occupies. In certain countries of Europe the skilled workman, the one who is a master craftsman, occupies an enviable position in his community. The success which an individual attains, whether it be through the completion of college courses or through the completion of a course of training which leads to skilled craftsmanship, is of more importance in determining his standing in the community and his usefulness to society than is the matter of whether he went to college or not. Perhaps a matter of even greater importance from a social and educational point of view is whether the individual, regardless of the profession, business or trade for which he has prepared, is willing as an adult to continue his education and to acquire information which will make of him an increasingly useful member of society.

INTEREST FACTORS IN INDUSTRIAL ARTS

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What are the factors which excite and hold the interest of pupils in industrial-arts courses? Dr. Smith presents an interesting procedure for attempting an answer. He suggests other ways to seek an answer.

THERE is an accelerating trend toward the making of Industrial Arts a constant in school programs. Thousands of schools now require that all boys pursue some work in this curriculum area. A large and growing number of schools encourage girls to take this type of work, sometimes a few in boys' classes, often in special groups of their own, and more often in evenly mixed classes as in algebra, history, and art.

In some situations the work is either wholly elective or is open to choice beyond a required amount. Under these free-will conditions we note marked difference in the percentages of pupils who enroll. Just as one community or school becomes enthusiastic about basketball and another of like size and nature does not, so one school enjoys large Industrial Arts acceptance while another faces the opposite and ignores or seeks the cause. This brief paper omits consideration of aims, offerings, and whole school attitudes toward the work. We are here concerned with the drawing and retaining power of the department itself, with the native, ingrained attributes which may create or thwart pupil interest.

Why these differences among schools? Aside from administrative plans, which may either incite or inhibit, what factors accompany or produce a steady, happy development? What other factors lead to dead-level or sickening decline? What leads boys and girls to desire to enter Industrial Arts classes, to desire to remain, and to desire to make purposeful and joyous adaptation? What are the pupil interest factors or the departmental enrolment builders?

Two or three years ago the writer asked these questions of a class group of experienced Industrial Arts teachers. An interesting discussion ensued and during the hour we listed a few items upon which there seemed to be agreement. At the next class meeting each member submitted in writing a set of factors based upon his experience and upon his more thorough and single-handed thinking. Duplicates were struck out and there remained the list of seventy items, which was mimeographed, as it appears herewith. The stencil has not been recut, despite some errors of overlapping, such as items 6—63 and 44—65.

Since the beginning we have secured checking of *the five most influential factors of interest* by 289 men. Practically all of these college students were experienced industrial teachers who happened during the year or summer to be taking the course in question. A few others were in the advanced stages of preparation for teaching or were school administrators with more than common interest in this work. As the list was presented to

these subsequent classes, to the total of 289 men, it was read by them in the classroom and opportunity was given for question as to the meaning of any numbered item. (Lack of space here forbids explanation of some few items which may not be obvious.) No discussion was permitted before checking was done because we desired that each man's response be unmodified by the experiences of others or by suggestion of the instructor's preferences. Before the close of each course each student was provided with the list of seventy items with frequencies to that date.

It will be noted by readers, please, that this project was an instructional one. It was not a study with definite technique and under careful control. It was a teaching device, a means of objectifying a single course-unit. It may be assumed that each student has made use, subsequently, of several ideas as to how he may increase his enrolment and render his work more satisfying to his pupils. The material is presented here in the hope that teachers and administrators may profit by study of the list of factors and of the weights of checkings. Our questions have been partially answered by a large number of men who have taught a variety of industrial courses, in a variety of school types and sizes, and who have become acquainted with tens of thousands of boys and girls.

When checking is limited to five items in a list of seventy, we may expect wide scatter and heavy concentration. It is the concentration in which we are interested. The fact that some items dropped entirely from view (16, 40, 43, 49, 53, 66, 68), and that some others received very low frequencies in a total of 1,445 counts, does not mean that these suggestions are worthless. The fact that some items received moderate value does not mean that they cannot be powerful in some situations and, particularly, with some teachers. They were rated in the best five by many. The whole matter is a comparative one, subject to a number and variety of modifiers.

Naturally we look for the factors of highest rating, and they are shown here in order, to the depth of ten.

2. adequate equipment
4. good method
1. attractive work rooms
21. variety in work
39. projects for possession
5. teacher with superior craftmanship
17. demonstrations
26. progress records
3. good discipline
30. good tools, in good condition

If these ten items characterize the work of successful, growing departments, the pattern is not forbidding nor impossible of attainment. We are on our way in these very directions. These suggestions have been made for years in our training courses, our books, and our journals.

Certain interesting low items are "class trips," "bulletin boards," "convenient seating," "routine well established," "group projects," "related information," "class discussions," and "school and community projects." This does not mean that we should forsake these. The teachers who failed to check them are, doubtless, giving some time and attention to them. And so one might continue an analysis of the ratings—as to specific items, as to group totals representing the physical, the social, the personal, etc.

There is at hand an extended list of items suggested by students as the project was in progress, items not included in the printed set. Many of them are worthy of place and should be considered in any thorough discussion of our topic. A few are shown as illustrative: guidance work by the teacher, cost of projects, free texts and instruments, well-designed projects, work books, scrap books, group approval of projects, and opportunity to invent and experiment.

It may be that interest factors in Industrial Arts are in some way different from those in Trade Training. It may be that certain shop subjects in either phase of our field have factors peculiar to themselves. It may be that teachers are so different in nature, rather than in background, that they would put premium or discount upon any given factor. It may be that boys, and grades, and schools are so different as to defy any formal list. Here is a study for someone, a piece of research of importance. The person who may elect to do such a piece of work should have two things in mind. *First,* interest in the work on the part of a pupil and interest in improvement on the part of the same pupil should not be confused. *Second,* it will be of more value to get the pupil's idea of what attracts and holds him than to have his teacher's idea of it, and this cannot be gotten adequately by the use of a check sheet. The teachers' combined reactions, as here shown, seem interesting and helpful. They might well introduce broader and more scientific study of the problem.

How 289 Men, Experienced in Industrial Arts Teaching, Voted on 70 Interest Factors

(*Each man checked 5 best, total 1,445 checks*)

1.	attractive work rooms	107
2.	adequate equipment	142
3.	good discipline	64
4.	good method	124
5.	teacher with superior craftmanship	82
6.	visual aids	22
7.	class trips	16
8.	useful jobs	29
9.	self-selected projects	26
10.	displays of good work	23
11.	teacher's business-like manner	10
12.	competitive exercises	6
13.	bulletin board materials	5
14.	collections, for use	3
15.	school and community projects	3
16.	students do grading	0
17.	demonstrations	73
18.	panels of tools, appliances, etc.	4
19.	good English, by instructor	1
20.	convenient seating	1
21.	variety in work	96
22.	improvement graphs	7
23.	no over-loading, no drudgery	15
24.	scatter of attention to individuals	19
25.	tests and examinations	10
26.	progress records	67
27.	evident aims	20
28.	a place for everything	4
29.	routine well established	2
30.	good tools, in good condition	58
31.	group projects	1
32.	make gifts for parents	5
33.	good light and air	6
34.	related information	15
35.	projects of current interest	57
36.	brief jobs	11
37.	rewards and incentives	13
38.	praise	18
39.	projects for possession	88
40.	notebook work	0
41.	overtime work permitted	48
42.	humor, good disposition on part of teacher	24
43.	time limit on jobs	0
44.	class discussions	8

45.	reference materials	1	58.	combination projects	2
46.	seasonal projects	9	59.	home repairs	2
47.	visiting speakers	5	60.	appropriate journals	4
48.	trade tricks	2	61.	encouragement of home workshop	10
49.	use of jigs	0	62.	objective testing	5
50.	annual exhibit	21	63.	slides and movies	9
51.	models to copy	1	64.	placing responsibility	13
52.	overtime work for nominal pay	1	65.	class discussions	5
53.	blackboard work	0	66.	special reports by students	0
54.	use of a text	9	67.	neat appearance of instructor	2
55.	all busy	5	68.	inspection of uniforms	0
56.	visitors, especially parents	1	69.	occasional new tools, machines	1
57.	bright colors	1	70.	freehand sketching	3

INDUSTRIAL ARTS AND MODERN SOCIAL TRENDS

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This is an excellent examination of the social significance of industrial arts in the education of modern youth.

THIS article concerns itself with the secondary level of education, roughly expressed by grades six to twelve as now organized in public schools. Here education is now completed, or at least largely so, by the majority of American youth. It has had a phenomenal growth during the last two generations. At the opening of the century it was only the scholarly few who completed the high school. Then the high school was the people's college. Today compulsory school-attendance laws, in almost all states, set at least sixteen as the age when children may leave school, and then, in many instances, only on the completion of certain grades or with an employment certificate. Gradually, especially during the last decade, work for sixteen to eighteen year old boys and girls has been more difficult to obtain. This and other conditions have brought many middle-adolescent youth back to school. Since 1890 secondary school attendance has increased from 200,000 to 7,000,000. While the high school curriculum has been expanded considerably, it is still predominately academic.

The school is one of the chief institutions of society. Increasingly it is being called upon to show the way and to provide means for meeting social needs. Society and its needs are constantly changing. The need for education implies a need for change. What are some of the modern social trends which have implications for the school?

First, our people have changed from an essentially rural population to an urban one. The mechanization of industry has brought the masses to the cities. Free land and pioneering have largely disappeared. With the technical development of industry and the consequent need for fewer workers employment has been more difficult to obtain. The early industrial age

called for child labor, but the later developments of machinery have decreased this demand until today industry, except in limited areas, no longer wants child labor.

Secondly, shorter hours of labor, brought about by the increased efficiency of industry, have made possible a vast amount of leisure for all. Science has made it possible for the home, the farm, and industry in general to perform its work with fewer hours of labor. The efficiency of mechanized industry has removed many opportunities for individual initiative, experiencing and creative adventure. Without guidance and direction a large part of leisure is wasted in aimless activities or in harmful and even criminal adventure.

Finally, a more social consciousness has been developing. The intimate connection of all activities of life has become more apparent. The need for socialization of all human affairs has been emphasized. All institutions of society are for the development of all of the people and not for the individual or for the few.

To preserve our democracy a more socially conscious and socially educated society is demanded. Increasingly we look to the school to meet these needs. Secondary education for the few, for those who are going into the professions, is giving way to the kind of education that will socially and effectively educate all for the manifold duties of life. Likewise opportunities for adventure, for developing individual initiative, for creative activities must be found in social uplift, better economic conditions and happier group living.

How is secondary education meeting these problems? Demands are being made for reorganization of the curriculum, for broader and more practical courses, for more attention to individual differences. A socio-economic core for the curriculum is being advocated. More independence for the secondary school, freer from college influence, seems desirable. Elementary and college curricula have, in the past, expanded and reorganized, but the secondary school has maintained, to a larger extent, traditional curricula and objectives.

What of the newer and more practical areas of education? These often have been designated as "special subjects" and have been tolerated but not given full credit in the educational program. Vocational courses have been included in the secondary-school program, largely in the cities. These have interested many boys and girls and made the school seem worthwhile to them. But opportunities for employment are often several years beyond the completion of such courses, and industrial employment is often too specialized to be met fully by secondary-school training.

Often the adolescent boy or girl is finding little in the secondary school to meet the needs of the many practical activities of life separate from those of a vocational nature. Modern living is so complex, demands so much technical understanding, involves so many unspecialized practical activities, so many challenging leisure-time adventures that the education of youth needs to be still further broadened. The opportunity for secondary education along these lines is great and deserves more attention than it commonly has received. How may practical-

arts education contribute to these needs?

What may now be called practical-arts education has had an uncertain and varied career in public-school education. The need for learning through doing was brought to our attention early in the studies of psychologists. The earlier psychology with its philosophy of faculty training, brought into our schools manual training, formalized drawing and kindred formal activities. These had a place in the educational program in getting away from mere book learning. Manual arts, under the influence of the arts and crafts movement, introduced more attention to art and beauty but gave little attention to the broader social needs and understandings.

The philosophy of John Dewey, that school is life, enriched the more practical activities of the school by giving them a social bearing. In industrial arts somewhat of the desire of Dean James E. Russell, that there should be an economic or industrial element in education as well as the established humanistic and scientific elements was realized. Dr. Bonser interpreted industrial arts as an understanding of the changes made by man in the products of nature to make them usable by society. As Dean Russell stated, the good elements of manual training and manual arts should be retained, but a socialization of these arts was essential.

Often, however, industrial arts has resulted, in practice, in not enough actual practical activity and in a study of industrial life without sufficient attention being given to the unspecialized practical activities needed in every home, on every farm and in the opportunities of leisure and in avocations. Dr. Henry Morrison seems to have had in mind even a broader conception of the significance of practical activities in education in his suggestion of the term "practical arts."

In recent educational literature "fine and practical arts" or "practical arts" is being used increasingly to designate all those school subjects which are not usually designated as academic. In secondary-school reorganization there is a marked tendency to reduce the extreme departmentalization of subject matter and to group related subjects in large "areas" such as the social studies, languages and literatures, and general science. With the addition of practical arts as an area of education there are then four or five large fields of educational material.

Another tendency in the secondary school is to open to election the same units of practical arts to both boys and girls. This is especially desirable in the junior high school, followed in the senior high school by some degree of specialization in industrial arts, home economics, and the like.

Practical arts, then, preserving the worthwhile elements of the earlier phases of practical activities, gives the secondary curriculum an area of education which meets the many unspecialized practical activities of living in a highly technical age, provides many profitable avenues for leisure-time endeavor, gives an intelligent understanding of industrial life, and furnishes significant vocational guidance. Thus the practical activities of the school are highly socialized, are within the reach of all, and contribute much to an understanding of the as-

pects of life so desirable in modern living.

In art, in music, in the commercial, industrial, and home arts—in the whole area of the practical arts—functional units meeting the practical needs and interests of youth and adults, must take the place of the pseudo-vocational, highly technical, faculty-training courses of the past. Thus this school area should be able to meet, in considerable degree, the needs expressed in studies of modern social trends.

While vocational education is deserving of all the attention being given it, general education must be extended, revitalized, and enriched to meet the needs of modern social living. To the millions of young people and to adults the schools, largely below the higher-education level, must provide many avenues for exploration, adventure, and creative activity. The old-line school areas must make greater use of the more practical activities of life to enable the masses to become interested in them and to profit through them.

This will be done as schools are reorganized to meet social needs, but there will always be an important form of learning activity found most fully in the area of practical arts. To teachers of all forms of the arts it should be a challenge. All children will become conscious of art, will acquire sufficient technical processes, will learn simple practical science, will learn to express themselves clearly in language, if these tools of learning, these bodies of organized knowledge, are joined to the needed activities of living. The industrial arts teacher can contribute much to these desired ends, in the making of good and contented citizens, if he will make the most of his opportunities. Let him use manual training, skill of hand, as a means and not an end in itself. Let him use the principles of art, not as an abstract thing but as a constituent of all practical creation. Let him introduce an understanding of modern industry as it is portrayed in each article made. Thus will the area of practical arts become a real factor in the secondary school program and contribute a vital part toward meeting the needs of modern life. General education will be enriched through directing the learning of children to meet many of the unspecialized activities of life, open up many avenues for leisure-time enjoyment and profit, provide an understanding of modern industrial life, and give worthwhile vocational guidance. Vocational training and industrial and professional life can then be entered more intelligently and with a broader background.

THE TEACHING LOAD IN HIGH SCHOOL

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Professor Selvidge here calls attention to a very generally neglected phase of the administration of industrial arts teaching. His list of duties and responsibilities of the industrial arts teacher will be interesting to many readers.

THE equitable distribution of the teaching load is a serious problem in many high schools. To overload a teacher in size of classes, or in number of classes, inevitably will bring unfavorable results. The effect of the overloading usually is manifest in the lowered efficiency of the teacher, increased nervousness, irritability, contentiousness, petty difficulties with pupils, and a general decline in the morale of the organization.

It requires a great deal of energy to meet from one hundred and fifty to two hundred people a day and to take care of the details of classroom administration, discipline, assignments, instruction and testing. It may be inevitable that teachers should meet such a large number of pupils but, if it is, appropriate rest periods should be provided and the physical surroundings should be made as comfortable and pleasant as possible.

Most administrative officers have been teachers of academic subjects and have some appreciation of the duties, difficulties, and responsibilities of such teachers. They know that such teachers must prepare lessons and grade papers outside of class and be alert and enthusiastic in class. They, therefore, wisely provide rest periods, or vacant periods, for such teachers to as great an extent as possible and try to provide pleasant and agreeable surroundings in the classroom.

Contrary to the popular notion the laboratory teachers and the industrial arts shop teachers are the ones most generally overloaded. For some unaccountable reason it has been assumed that the demands on the energy of the laboratory or shop teacher are much less than the demand on the ordinary classroom teacher. On the contrary, a careful examination of all the factors involved will show that the energy demand on the laboratory or shop teacher is not only greater hour for hour, but that the shop teacher, by the very nature of his work, is subjected to many unusual and severe demands which are not made on the academic teacher. Untidy shops, disorder, and poor teaching often are the result of such overloading.

In considering the schedule of the industrial arts shop teacher in comparison with the schedule of other teachers, the character of his duties and responsibilities should be taken into account. The following are some of the demands he must meet over and above those of the academic teacher, and they should be considered in fixing the teacher's daily schedule:

1. He must care for, store, and distribute materials and supplies.

2. He must keep an inventory of supplies in order to be sure they are adequate.

3. He must be constantly on the alert to avoid the waste of materials and supplies.

4. He must consider and keep account of cost of materials. This usually involves a separate account for each pupil.

5. He must prepare materials for class use in order to avoid waste and loss of time when a class assembles. This usually must be done outside of class.

6. He must so plan and assign work that he will have adequate supplies of materials of the kind needed, and must so arrange and coördinate his assignments as to avoid conflict in the use of special tools and machines, or tools which are not supplied in such quantity as to make one available to each pupil. If this is not carefully done, idleness, waste of time and disorder will result.

7. He must care for and keep in order and good condition a great many tools and pieces of equipment. This usually is a very heavy task, as tools and equipment are likely to be put out of order by the untrained pupils. It is no more feasible for a shop teacher to do this during a class period than it is for an English or history teacher to grade her papers during a recitation.

8. He must be constantly alert to prevent any unsatisfactory conduct on the part of pupils. On account of the freedom with which pupils move about the shop and come in contact with each other, this is a much more serious problem than it is in academic classes.

9. The teacher must be constantly on the alert to prevent accidents and injuries.

10. He must remain on his feet constantly, while the academic teacher may sit at least a part of the time. This means greater physical strain.

11. In many instances he must work on a concrete floor, which is particularly tiring when one must be on his feet constantly.

12. In general, the room is not as pleasant and the physical environment is not as agreeable and satisfying as the ordinary classroom. This is emotionally depressing.

13. The noise incident to the many activities and the greater variety of demands on the teacher create such a nervous strain that at the end of the day he is exhausted.

14. The students generally are working on a greater variety of problems, or on different phases of the same problem, thus requiring constant adjustment of the teacher in the supervision of the work of the different pupils, and in giving a great variety of instruction.

15. The preparation of instructional material and the keeping of achievement records is fully as difficult as it is for the academic teacher.

A careful observation of the work of any good shop teacher will verify these statements. In the interest of good teaching and humane considerations, the shop teacher should have at least as many non-class periods as the academic teacher.

"OUR CONTEMPORARY ANCESTORS" AND INDUSTRIAL ARTS EDUCATION

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Dr. Ashley gives here an unusually interesting account of the influence of certain important groups of educators on modern industrial arts education.

FOUR groups of people are primarily responsible for all development from the point of view of time. They are: (1) Those who may be classed purely as ancestors who lived and thought in the past; (2) those who may be thought of as "contemporary ancestors"[1] because they either lived in the past and whose thoughts are contemporary with ours, or they are physically alive but think in the past; (3) those who live now and think as their contemporaries; and (4) those who live now but think a generation or more in advance of their fellows. This paper is limited to the second of these categories and to the extent that its components may apply to industrial arts education.

At the outset, one needs to mention the group for whom Page coined the phrase "Our Contemporary Ancestors," the mountaineers of Kentucky, who have allowed themselves to drift into a physical environment impracticable for modern means of communication to penetrate. Civilization has passed them at least two generations. Page could rightly refer to them as "Our Contemporary Ancestors," for though living, their physical and mental attainments belonged to the past.

Like all peoples from earliest time who have lived in primitive situations, their lives depended upon the arts and skills necessary to procure food, clothing and shelter. Industrial arts, though not in their vocabulary, is evident in the knowledge of intrinsic values and processes used in obtaining these essentials. The heritage they leave to others is a material one and consists principally of craft work in textiles and pottery.

People Who Lived in the Past, But Whose Thoughts are Contemporary.

Another type of contemporary ancestor is represented by a long list of names—people who have given to us material, social, and professional heritages which are gauges of and indices to present progress. The attainment in knowledge and skill by the ancients as shown in the fifty centuries of exhibits on display at the Toledo Museum of Art, surpasses the understanding of laymen today in the realm of beautiful glassware. This may also be said of ceramic materials from the tombs of the Pharaohs, the iron and copper work of the ancient Romans, the bronze work of Egyptians and Cretes, or the early printing by the Chinese. Articles of furniture of the period of the Louis of France and the Tudors of England have come down to us as works of art. These things are sought, studied, copied, and improved for present use where possible.

1 The phrase "Our Contemporary Ancestors" originated with Walter H. Page. See: Henrick, Burton J., "The Life and Letters of Walter H. Page." New York, Doubleday, Page & Co., 1932. Volume 1, p. 60.

They represent the efforts of men with master minds who, while working in the past, live in the spirit and processes of present enterprise. Their accomplishments furnish the layman and student alike with a wealth of interesting data on the cultures of the past which, among other things, leaven contemporary ego.

Another long list of names may well begin with Hammurabi and include Confucius, Plato, Socrates, Jesus, St. Paul, and many others down through the centuries—great philosophers and scientists who attempted to remove ignorance and superstition and who set forth principles for individual and group living, valuable not only in their day, but equally so now. Great poets and dramatists belong with this group, for they were not only philosophers, but they knew how to reach people through beautiful and subtle language, and consequently were able to give perspective and direction to human tendencies and attitudes. This group of men has built up a great social heritage consisting of the art of living and progressing with others. The literature left by them contains the basic principles of our present social state.

A third list of names, equally important and yet of more immediate concern to teachers and students of public school education, includes the great teachers and writers on education. This list contains several prominent philosophers already mentioned, but primarily begins with Martin Luther, who was responsible for the great movement for secular education and for the idea that all children should be taught. This category holds the names of Comenius, Rousseau, Pestalozzi, Heusinger, Locke, Voltaire, Froebel, Bacon, Milton, Petty, Fellenberg, Herbert, Hartlib, and others. Their combined writings furnish the underlying principles of present day policies in school teaching, subject matter, and learning. Principles are important. They are like axioms, in that they are universally recognized. Any phase of education, industrial arts, English, mathematics, or agriculture, derives its excuse for being from accepted educational principles. Outstanding among thoughts of these ancestors that may be considered contemporary with twentieth century notions of education are the following:

1. Very young children can learn.
2. Individuals differ.
3. A child's world is not an adult's world.
4. Knowledge grows from experience.
5. The printed page furnishes impressions only as the background of the reader is capable of reflecting them.
6. Wide acquaintance with nature, men and things is necessary if learning is accomplished.
7. One learns to do by doing.
8. One learns from sense impressions.
9. Education should consist in gradually adjusting to the social state or age of which one is a part.
10. To understand the social order, one must participate in its activities.

Many other principles have come to us from the writings of this group,[2] but in the main, they, like most of those set down by present-day writers on education, do but re-emphasize and reiterate these ideas. The industrial arts, which have been planned to furnish experience with industrial activities at various age levels, derive their bases for subject matter and direction

2 See: Ashley, Lawrence F., "Industrial Arts Values," Education, Volume LIII, No. 8, April, 1933, p. 487.

from these same principles as do other subjects. Teachers must be fully cognizant of them if worthwhile goals are attained. As a school study, industrial arts has largely supplanted the older manual training and manual arts teaching, because those subjects were found to be inadequate when measured by accepted principles. Industrial arts does not connote any particular hand skill, such as might be the purpose of a book-rack project with a blind dovetail joint, but goes far beyond this by establishing a knowledge of the materials of nature —how they are extracted, combined, and shaped by man for his use, and how his whole life is affected by the changes so wrought. If the long-established principles relating to subject matter and method are fully understood and recognized, one will not think of planning an industrial arts program without having at hand an analysis of the social life in which the child now lives and into which he will ultimately go. The United States census, for example, will enable him to know into what major categories society may be divided in obtaining food, shelter, clothing, and recreation. One may then decide which activities can be brought in miniature to the classroom and how to adapt them to the needs of children at different age levels.

A degree of skill is encouraged in all activity work, but a student of child development will keep the industrial arts program well divorced from any real vocational aspect until the latter part of the teen age. Adults who question this point should ask themselves, "At what age did I know definitely what I was going to do the rest of my life?" A surprising majority will say, "At least twenty-five."

An understanding of principles and philosophy which have present acceptance, points to the need for early orientation in life activities in keeping with child nature, interest, and ability. An early knowledge of what the social order is composed, through vicarious and real participation will enable the child to select with more intelligence his future place in it. He will then be able to concentrate at a much lower age on a life vocation.

Men Who Live Now But Think in the Past.

A third conception of "our contemporary ancestors" refers to men who are physically our contemporaries, for they live now in the flesh, but who are mentally our ancestors, for they think only in the past. This category is a formidable one for those interested in educational progress. It contains the names of many who have been put in high places by like-minded constituents. One may even find state superintendents of public instruction, college presidents, deans of instruction, superintendents of schools, principals, teachers, board members, and, naturally, patrons on the list. If they have known that any educational principles have evolved, they have either forgotten them or they prefer to flaunt their ego by setting up their own ideas regardless of the lack of a fundamentally sound basis. They are the ones who still talk "manual training" and who impose on their schools vocational work before the children are ready for it because of the lure of a *Federal Subsidy Dollar*. They are the ones who cling to the "three R's" as the

essence of education. They are the ones who boast of the small amount they spend annually on their children by holding down teacher qualification so that salaries may be low and by refusing equipment and opportunity in the name of economy. How fortunate is California that her children are safeguarded in her constitution from this group. It is this group about whom patrons must be informed, for they are the usurpers of the birthright of every child — a "just and generous education."

This paper has been concerned with the evaluation of several categories into which groups responsible for education may be classed under the caption "Our Contemporary Ancestors." The first group held little of educational significance and consisted of those people living now but ancestral in their physical environment and mental attainments. The second group lived in the past but are contemporary in that they have furnished materials and thoughts that are the vogue today. The third group live now in a contemporary physical environment but refuse to be anything but ancestral in their ideas. This group, because of ignorance or the "tender nerve leading to the pocket-book," has been the stumbling block to general education — hence to industrial arts as a large factor in child development.

EXPLORATION AND GENERAL EDUCATION THROUGH INDUSTRIAL ARTS

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Mr. Fales here presents a stimulating and very helpful examination of the vocational-guidance and educational values of industrial-arts in the junior high school. His treatment of the correlation of this subject with academic courses is particularly interesting.

Junior-Senior High School Objectives

ALL shopwork which is taught in the public schools falls, as far as objectives are concerned, into two groups,—vocational or non-vocational. This article is confined to the type of school shopwork which is commonly called Industrial Arts and which is strictly, for identification purposes, of the non-vocational type. This statement is made with the full understanding that in rare and unusual cases an individual may derive some actual trade preparatory values. The bulk of the value received from industrial arts work is unquestionably part of the general educational experience which is needed by all children regardless of their interests, economic status, geographical or industrial environment. It is predicated upon the assumptions that we all use the products of industry, enjoy *doing* things, learn through doing, and that we must find our life work in a civilization which employs one-third of its workers in mechanical industries.

Authorities, leaders and authors in educational work, when asked to define educational objectives for junior high school education seem to stress exploration and general education. Senior high school objectives are more vague. Certainly, both of these periods of school life are concerned with adolescent pupils. To be sure, there are some characteristics of the junior high school pupil which are different from those of the senior high school pupil. Generally speaking, however, they are both relatively immature, seeking a life work and adjustment to the world at large. Their life plans have not crystalized nor can they be expected to, unless perforce they are under economic pressure. In this case, the lack of finances and education restrains the majority from preparing for anything other than semi-skilled laboring, clerical, commercial and industrial positions.

Exploration

Exploration in industrial arts work may be interpreted in two ways. It may be a self-finding process in which the pupil attempts to discover that type or types of work for which he is endowed by nature, or it may be interpreted as an exploration of industries offering possible employment.

To one who sees it as a self-finding experience, industrial arts work offers many types of interesting activity. Theoretically, it should provide all experiences with tools and materials which might interest a pupil. Practically this is impossible. Consequently, we have developing over the

country, many types of general and general unit shops, each offering the pupil a variety of fascinating experiences.

For the last three decades, we have consciously or unconsciously been developing interesting kinds of shop-work. We made progress when we dropped the exercise method and adopted the policy of making useful articles. Even the scheme of expecting every boy to make the same thing at the same time is being gradually set aside. Individual work, development of creative interests, and stimulation of constructive thinking via the route of airplanes, bird houses, boats, archery, mechanical apparatus, motors, radios, telephones, etc., tend to draw out the pupils' native abilities and aptitudes.

When we wish to explore industry for guidance values, boys are led to make articles which are typical of the various industries. The metal fields illustrate this type of education best. Here we find that school shop metal working industries are built around the working of hot and cold metal. Some industries shape metal and others assemble metal parts. As these types of work are developed in school shops, we find foundry or soft metal casting, welding, sheet metal, art metal, ornamental iron work, machine shop practice, automotive work and plumbing defined clearly. Each of these is representative of a trade classification around which can be built a structure of guidance, experience and information which will aid most children to form a clear concept of the work which should play a negative or a positive part in his career determination. The manipulative work, the associated study and discussion develops concepts of our industrial life and the industrial conditions peculiar to this age.

General Education

The general education objective is very vague in the minds of most of us. It is a blanket phrase which will admit of many interpretations. In the field of industrial arts education it calls for that type of education which is an important part of the study of our practical arts heritage, or, that which is essential to effective living in this power and machine age.

The practical arts heritage includes the knowledge and understanding of the growth and development of our industries and appreciation of such things as the origin of soap, paper, porcelain and china, electrical appliances, machines, and the thousands of other industrial commodities which we use daily. Early forms of industrial products, designs, and the social economic changes leading to milestones in their development, help to provide the rich understanding and background upon which modern civilization is established. Herein lies the truly cultural aspect of life.

General education from society's point of view calls for a well integrated program of studies. In these studies, knowledge and information are essential. In themselves, however, there is little education. Real education lies in the use which is made of facts. It is, therefore, evident that problem-solving situations must be created for the pupil. He should be placed in an environment where he must use his knowledge to develop skill in problem-solving. The

classroom subjects furnish much of the factual data and industrial arts provide an opportunity for the pupil to try out some of it in a real life situation.

Industry, which is the foundation of present-day civilization, cuts across some portion of all of the school subjects.

English, the most generally required subject of all, might build vocabularies including words used in shops. Essay writing based on the activities of shops can be very constructive. Oral expression regarding industrial subjects is desirable. Even the semi-skilled shopman reads books concerning his work. There are so many places where the workers of industry must use English and can be helped in its use.

Science is the foundation of all industry, or to rephrase it, science would have little value were it unable to find ultimate usage in industry. Why does paint dry? How is electricity generated? What is the action of a lubricant in a bearing? How is printers' ink made? These and many other science questions are revelant to the teaching of industrial arts.

Art, good and bad, increases or limits the sale and usage of the products of industry. Well-designed articles find ready sale. Articles in school shops should not be construed except in conformity with the best principles of art. It is essential to all good construction.

Related mathematics is an essential subject in every shop.

Freehand shop sketching is usually considered a part of good industrial arts instruction. It leads to a desirable consumer skill.

Pupils should be taught something of the value of tools, time, materials, labor and industrial products. Consideration of the simple economics of industry is a part of the study of industrial arts work.

The sources of materials, trade routes, and location of industrial centers are important.

Historical events in history, discoveries, inventions, and prominent men in industry may be studied with profit. While these are sometimes taught in other classes, close relationship in the shop aids in fixing that perspective which is a part of general education.

Everyone in this country spends a large proportion of his income on the products of industry. If industrial arts is to provide general education, it certainly must include the rudiments of selection, purchase, use, care and repair of these commodities, particularly those items which are constructed by the pupils.

Supplementing the construction of articles which involve distinct processes typical of certain trades, such as sheet metal, carpentry, printing, etc., many instructors provide organized instruction regarding the "guidance" data which pupils need. Closely akin to the above are the relationships between employee, employer and consumer groups. These are sociological-industrial problems fraught with emotions, yet worthy of considerable cool, deliberate and impartial discussion.

It is, therefore, apparent that some general education is attained through industrial arts as it cuts across most of the school subjects, and many of the out-of-school activities of boys and girls. These contacts with the rest of the educational system and life, help

the pupil to understand this complex industrial civilization in which he finds himself. Certainly, anything which aids in his orientation is a part of general education for the pupil.

Children do not see these relationships readily without assistance. Teachers of industrial arts should be able to help the pupils to discern the truth clearly and quickly. That being the case, it behooves instructors to develop well organized teaching, demonstration and discussion lessons. Such lessons should be scheduled regularly throughout each course regardless of the grade. As a rule, teachers find that twenty to twenty-five per cent of the class time can be devoted to instruction without detrimental effects. With it, the shopwork is general education. Without it, shopwork becomes "busy work," or *manual* training, or possibly a creative type of work without the broad rich contacts which grow out of a study of the industry and its influence on our lives.

Study of this type is superior to strictly book-work classes, inasmuch as the hand work provides another entrance to the mind. It also serves as a stimulus to the mind, quickening it and providing the needed incentive to careful and effective study.

In summary, industrial arts work provides an opportunity for a teacher:

1. To try out the pupil through the making and studying of a variety of interesting articles that provide him with experiences which will aid him in the discovery of his interests, aptitudes and abilities.

2. To present to the pupil, through shopwork, visitation and study, the best possible exploratory concept of what industry is and what it does.

3. To correlate the activities of the school shop with the pupil's school and home life.

THE INDUSTRIAL ARTS CURRICULUM [1]

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A very careful analysis of the problem of curriculum construction with special reference to industrial arts.

DURING the past two decades very few schools and school systems throughout the United States, have failed to reorganize their curricula and courses of study. The underlying cause is the dynamic age in which we live — an age of power, speed, and rapid changes. The changes are social, economic, industrial, political, and educational.

Social and economic forces are recognized by progressive educators and curriculum changes are made accordingly. In addition to the previously mentioned factors there may be added the following reasons why curriculum changes have occurred:

1. A greater universality of education for the masses.
2. The extension of education — downward as well as upward.
3. Improved teaching methods and techniques.
4. Improved techniques of educational research.
5. Better prepared teachers.
6. Increased enrollment, especially in the high schools.
7. A clearer conception of the aims of education at the various school levels.
8. The inception of vocational (less than college grade) and semi-professional courses.
9. Changes in college entrance requirements.
10. Improvements in financing public education.

Despite the fact that the industrial arts teacher was among the first to realize the significance of individual differences, and the first to apply remedial measures in an effective manner, it is only recently that industrial arts activities have been revised and reorganized in conformity with modern educational theory and practice. The revisions in Industrial Arts curricula are due to the following factors:

1. A realization that creative and constructive intelligence is more abundant than abstract intelligence.
2. The influence of Smith-Hughes Vocational Education. The inception of this program demanded a revision and restatement of objectives and assisted in the development of certain techniques of analysis for organizing subject matter content.
3. Better trained teachers. Teachers who, in addition to manipulative skills and abilities, possess a broad generalized academic training.
4. The increased enrollment in the high school. A student body that is less selective than formerly and a decrease of pupils who are "academically inclined."
5. The necessity for a broader and more diversified program of general education prior to specialization or vocational training.

Confusion Relative to the Curriculum.

For the past few years the majority of classroom teachers have been harangued in many of their professional meetings by professors of education

1 Industrial Arts is that part of general education concerned with satisfying the innate constructive tendencies of man and the development of an intelligent understanding of our modern industrial civilization and its attendant problems, through contacts and experiences with a wide variety of industrial materials, processes, and tools of manufacture.

regarding the curriculum. Terms, such as coördination, correlation, integration, fusion, scope and sequence, etc., have been used very glibly by speakers. This has resulted in much pedagogical confusion.

The chief difficulty lies in the fact that the educationist can theorize and philosophize very glibly, in his attempt to modernize educational procedures and have them parallel modern psychological, social, and economic trends. Classroom teachers desire definite methods of procedure, techniques, and subject-matter content. Teachers want to know specifically what they are supposed to teach. Invariably the theorist does not furnish this material. The result is distressed and distraught teachers. The philosopher and practitioner are both necessary. The former to point out the goal and give direction; the latter to determine the procedure and activities necessary to reach the goal or objective.

Major Problems to be Solved by the Curriculum-Maker.

At the outset of his task, the curriculum-maker must find solutions to the following problems:

1. To determine the desirable objectives of pupil development.
2. To decide what activities are essential for attaining these objectives.
3. To discover the learning processes involved in these activities.
4. To formulate effective methods for the selection and organization of subject-matter for the various grades.

Sources for Curriculum-Making.

Basic sources for curriculum construction are important and frequently difficult to determine. Among the available sources are:

1. The history, evolution, and experiences of the race.
2. Past and present curriculum practices.
3. Investigations of the objectives of education.
4. Pupils' racial, social and cultural background.
5. The pupils' capacities, abilities, interests, and needs.
6. Local educational traditions, tendencies, and current situations.
7. Techniques that may be employed: (a) concensus of opinion; (b) survey; (c) job analysis; (d) activity-analysis; (e) social-philosophic; (f) experimental; (g) combinations and variations of 1, 2, 3, 4, 5 and 6.

A Suggested Technique for Constructing an Industrial Arts Curriculum.

The following plan has been evolved by the writer in coöperation with prospective industrial arts teachers and industrial arts "teachers in service":

1. A brief description of the subject to be analyzed. (Examples: woodwork; electricity, printing, etc.)
2. Occupational census classification (1930 census).
3. Allied occupations and their relationship to subject analyzed.
4. General objectives and values of industrial arts.
5. Terminology (technical terms peculiar to subject).
6. Operations of subject (hand and machine).
7. A list of tools (name; care in use; care not in use).
8. A list of materials (name; recognition properties; working properties).
9. A suggestive list of projects that may be constructed.
10. A progress chart (the following data are to be included: school; term or semester; subject; name of student; days; hours; bench, locker, tool number; operations; projects; new elements to be learned, etc.).

Integrations. (The practical application of "academic work.")

11. English (spelling, oral and written expression).
12. Mathematics.
13. Natural Science (botany, physics, chemistry, etc.).
14. Social Science (history, geography, economics, etc.).
15. Drawing (mechanical and freehand).
16. Art and design.
17. Hygiene.
18. Safety.
19. Desirable habits and attitudes.
20. Guidance (educational and occupational information).
21. Tests (objective type for pretesting and testing).
22. Instruction sheets.
23. Selecter references.
24. Complete analysis.
25. Course of study for a particular grade.

Course of Study for a Particular Grade.

After completing an analysis for a field such as woodwork, metalwork, electricity, etc., it becomes necessary "to break down" the materials and organize a course of study for each grade level. The elements involved, in addition to the grade level, are: age, time-allotment, equipment, materials available, pupil ability, interest and need, school objectives, etc.

The following is an example:

EIGHTH GRADE WOODWORK

1. *Objectives:*
   (a) General: Example—To offer opportunities for self-expression.
   (b) Specific: Example—To lay out and construct the common woodworking joints.
2. *Abilities to be Acquired:*
   (a) Manipulative: Example — To cane a chair seat.
   (b) Informational: Example — To select stock.
3. *Suggestive Projects:*
   Example: Airplane, boat, etc.
4. *Integrations:*
   (a) *English:*
      (1) *spelling* — word lists from technical terms.
      (2) *oral:* Example—"A Trip to an Airport."
      (3) *written:* Example — "A Drive Through the California Redwood Forests."
   (b) *Mathematics:* Example—Board measure.
   (c) *Natural Science:*
      (1) *Botany:* Example—Classification of trees and wood.
      (2) *Physics:* Example — The wedge and its uses.
      (3) *Chemistry:* Example—The effect of heat in sharpening and grinding tools.
      (4) *Etc.*
   (d) *Social Science:*
      (1) *History:* Example — The development of hand tools.
      (2) *Geography:* Example—The geographical location of various woods.
      (3) *Economics:* Example—The effect of modern machinery upon the industrial worker.
   (e) *Drawing:*
      (1) *Mechanical:* Working drawing of project to be constructed.
      (2) *Freehand*—Shop sketches.
   (f) *Art and Design:*
      (1) Use of project.
      (2) Type of design.
      (3) Type of construction.
      (4) Finish, enrichment and ornamentation.
   (g) *Hygiene:* Example — Personal habits of the shop worker.
   (h) *Safety:* Example — Set all guards before starting a machine.
   (i) *Habits and Attitudes:* Example — Dependability; coöperativeness, etc.
   (j) *Guidance:* Occupational (see guide to study of an occupation of major analysis).

(k) *Tests:*
(1) *True-False:* Example—Oak is classified as a hard wood.
(2) *Multiple Choice.* Example—A firmer chisel is used to cut: (1) iron; (2) wood; (3) steel; (4) concrete. Ans....
(3) *Matching.* Example—1. mallet ..... (2) bit
2. brace ..... (1) chisel.
(4) *Completion.* Example—1. ..... is used to thin shellac.

(l) *Instruction Sheets:*
(1) *Operation Sheet.* Example—(a) To sharpen a wood chisel.
(2) *Information Sheet.* Example—(a) The effect of working with dull tools.
(3) *Assignment Sheet.* Example—(a) To find the number of board feet in a project.
(4) *Job Sheet.* Example—(a) To construct a flower-box.

(m) *Selected References:*
Example—Roberts, William E. "Woodwork in the Junior High School." 1930. The Manual Arts Press, Peoria, Ill.

This plan is not to be construed as a technique that is standardized, rigid and inflexible, but, on the contrary, a plan that permits flexibility without destroying the basic structure. The teacher must remember that an analysis is never complete. Therefore, it is suggested that additions and deletions be made whenever necessary, to keep the curricula and courses of study abreast of modern educational, occupational, social, and economic tendencies; while at the same time suitable provisions are made for pupils' capacities, aptitudes, abilities, interests and needs.

Conclusion.

Progressive Industrial Arts leaders are planning programs from the kindergarten through college and university.

In the elementary school the work should consist of the changes man makes in materials for sustenance, and the social problems related to them. These activities should vitalize and clarify the fundamental tool subjects.

If the junior high school is to be a period of "exploration, tryout, and finding," let us provide some insight and experience in the major occupational fields of human endeavor. I suggest eight major fields: woodwork, metalwork, electricity, transportation and communication, graphic arts, ceramic arts, textile arts, and agricultural arts.[2] Thousands of occupations are to be found under these occupational divisions. The junior high school program should provide for a sampling of each.

For those senior high school pupils who lack interest and ability to do abstract work successfully, a program built around one or two of these major divisions is suggested.

As secondary school pupils advance to the junior college, and this is a definite trend, in view of the increased age of entrance into employment and the inability of youth to find work, opportunities should be provided for a two-year vocational course, for those who plan to enter employment at the end of the junior college. If a student has been interested in the field of graphic arts in the junior and senior high schools, he may select commercial art, drafting, etc., for his preemployment program in the junior college.

Furthermore, there is a current

[2] Agriculture is becoming more mechanized and industrialized every day.

tendency to make collegiate education extensive rather than intensive. Provision should be made, therefore, for the development of avocational and leisure time abilities. Industrial arts activities offer splendid opportunities for such training.

In addition to the groups mentioned previously, an industrial arts program can function effectively, and bring enjoyment and intellectual enrichment to groups and individuals found in adult education and recreation centers, C.C.C. camps, the physically handicapped, the socially maladjusted and numerous others.

NEW AREAS IN INDUSTRIAL ARTS

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Mr. Hindermann presents important areas of study often neglected and which are appropriately dealt with in industrial arts courses.

DEVELOPMENTS, improvements, and innovations in the industrial arts curriculum have been the rule rather than the exception during the last decade. Since skill and the vocational aspects of industrial arts have been stressed in the past and doubtless will continue to be important in the future, it seems well to consider some of the newer areas of the industrial arts curriculum that are rising to positions of importance in the present social scheme.

Great opportunities seem to present themselves in developing the pupil's understandings and knowledges of the complex mechanical aspects of the environment; in creating pupil sensitivity to significant problems; in providing consumer education relative to the wise purchase of mechanical commodities; and in assisting pupils to acquire social attitudes that tend toward actions which result in the achievement of personal and social ends.

Pupils can develop a working industrial background through a study of the mechanical aspects of the environment in their industrial arts courses. Following is an abbreviated list of devices and situations that require industrial intelligence of individuals if they are to adjust themselves to them satisfactorily: using automatic hat and coat lockers, operating automatic heating plants, city boy on a farm, experiences at an amusement park, operating an automobile, operating a furnace, polishing floors, running a small motion picture projector, running an elevator, using shoe shining machines, taking motion pictures, taking auto trips, following traffic lights and signals, using hand tools, using modern household conveniences, using automatic machines for inflating tires, and recharging water softeners.

It also seems very important for pupils to know that: molybdenum will soften the spring ride of automobiles; forty-three per cent of all steel is produced in sheets and strips on rolling mills one-half mile long — costing twenty million dollars each; eighty-three different steels are used in automobiles; carbon makes steel brittle,

chromium is the basis of the stainless steel industry, tungsten alloys strengthen with heat; activity in the steel industry is at the 1929 peak, while fifty per cent as many men are employed in production and fifty per cent more in distribution than before the depression; one pound of molten glass can be spun into a thread that will reach around the earth; glass alone is being used for eighty-foot towers in new buildings in Detroit and New York; there is a new type of safety glass which is seventy per cent stronger because it bends; glass has been found to be an excellent road surfacer and can be made from broken glass receptacles. Information about the foregoing is being acquired through independent investigations and written reports by industrial arts pupils. The information that pupils gain by this enriched program assists them in making intelligent decisions relative to their adjustments to the mechanical aspects of the environment. It represents the kernel of an industrial background and is the basis for developing industrial intelligence.

A second new area of emphasis has to do with the development of pupils' sensitivity to significant problems. It represents a more extended and intensified attack upon some of the problems that have characterized the teaching activities in industrial arts since its beginning. This new emphasis seems warranted because of rapid technological changes and has made the problem of helping pupils see relationships a very vital one rather than one of only incidental importance. A list of examples follows:

Mechanical Problems

Symptoms—Sparks fly when plugging into socket.

Problem—Remove plug from socket and remake connections in plug.

Symptom—Odor of gas in room around stove.

Problem—To shut off all outlets and test for leak by soapsuds method and tighten same.

Symptom — Clothes come through wringer dripping wet.

Problem—Tighten rollers or replace with new rollers.

Symptom—Clattering, shuttering vibration of a faucet.

Problem—Remove worn ball or gasket and replace with a new one.

Symptom—Water continuously running through commode.

Problem—To place new vacuum cup or adjust it to fit opening.

Symptom—Cold winds blowing in around doors and windows.

Problem—The weatherstripping of all doors and windows.

Symptom—Going down a steep hill the car moves too rapidly.

Problem—Use the same gear going down the hill that you would use going up.

Symptom—Camp stove refuses to burn after fuel is put in tank.

Problem—Clean burners and unstop generator.

Employment Problems

Industrial arts pupils should study some of the following problems as they relate to the courses in which they are enrolled: scientific divisions of labor; production in industry; requirements that are generally necessary for success as a semi-skilled laborer; the industrial worker and leisure time; the speed requirements of industrial occupations; strikes or labor disputes and the various methods of settling them to the best interests of all concerned; economic status of employer and employee; bonus sys-

tems in industrial shops; industrial accidents and their prevention; labor unions and their characteristics; the effect of emotional disorders on the worker; the effect of working conditions on health; and the advantages and disadvantages of learning an occupation by the apprenticeship method. A knowledge of relationships and conditions such as the foregoing is the basis of sensitivity to significant problems and enables a pupil to gain a more discriminating power of analysis as he gradually grows and seeks the meaning of new relationships and changing conditions.

A third new area to be considered is consumer education. The consumer is not only confronted with the wise distribution of his budget, but also with the choice of commodities in terms of quality and service. The latter is a difficult task in these days when so many rackets are in vogue. It seems important to have the boy consider a commodity on the basis of: conditions in use, qualities necessary for satisfaction, cost, use of article for the purpose and in the manner intended, protection from wear and damage not necessary in use, importance of making necessary repairs and adjustments properly, and the proper care of an article when in use.

One of the most baffling of these problems is how to determine quality. Consider the following examples:

Furniture — in order to determine the quality of furniture one should consider such items as materials, finish, fastenings, joints, and hardware. Qualities of these items are listed in order of their desirability for most uses. Materials—solid cabinet wood, veneered with a cabinet wood. Finish —varnish, lacquer, shellac, and wax. Fastenings—glue, screws, nails, and corrugated nails. Joints — mortise and tenon, dovetailed, dowelled, miter dado, splined, and butt. Hardware—solid, plated, enameled, and plain steel.

Cottage — points of primary importance to consider in buying a cottage might be mentioned as follows: (Possibilities are listed in order of their desirability.) Foundation—brick, cement block, tile blocks, concrete, and cut stone. Roof—slate, composition slate, shingles, composition shingles, paper composition (surfaced), and paper composition (unsurfaced). Weatherboarding—yellow poplar, redwood, and pine. Heating plant—steam, hot water, hot air, and stove. Water supply—municipal, private company, and individual. Sewage system—municipal, private company, and individual. Floors—oak, maple, hard pine, and hemlock.

Much other pertinent information should be obtained before buying property, in an urban district especially. The following are some of the more important items: the tax rate; the assurance of a clear title; possibility of unpaid street assessments; permanency of water supply; possibility of flood; adequacy of fire protection; insurance rates; accessibility of church and school; building restrictions; and contemplated municipal improvements.

Consumer skill and knowledge are of real concern to high school pupils because, as high school pupils, they are consumers and consequently the education is vitalized and functional rather than of the cold storage variety.

The fourth new area places added

emphasis upon the development of social attitudes of intelligent tolerance and coöperation, which, in turn, are based upon an understanding of social interdependence. The error of much teaching at present is that pupils merely verbalize about social interdependence and do not really accept the fact and govern their practices accordingly.

One spring afternoon the writer was to accompany a class on a trip to a veneer plant, and the group had gathered on one side of the street awaiting the green light to cross to the cars that were to be used in traveling to the plant. As the green light came on three youngsters started across the street and as they neared the middle of the intersection two sewer cleaners emerged from a manhole, covered with slime and grease. The three inconsiderate boys, on seeing the men, held their noses and made a wide circle, giving the men a feeling of resentful chagrin. Now none would have expected the boys to rush forward and shake these men by the hand, but knowing the need for having clean sewers it would have been the part of courtesy to pass the incident apparently unobserved.

Clearly this anecdote suggests a lack of understanding on the part of these boys in this instance. The experience of having participated in this situation where the attitude of tolerance and the feelings of persons were important, made it possible for the class to learn several of the real meanings of social interdependence. Needless to say the class discussions that followed the excursion were motivated, functional, and practical.

It will be very interesting to observe, aid, and evaluate the growth and development of the following new areas: assisting pupils in developing an industrial background; making pupils more sensitive to significant problems; informing them of consumer values and having them accept intelligent attitudes of coöperation and tolerance.

THE CONTRIBUTION OF INDUSTRIAL ARTS TO TWO GENERAL SECONDARY SCHOOL OBJECTIVES

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A clear-cut presentation of the use of industrial arts as a means of realizing specific objectives of the secondary school.

OBJECTIVES, or the end-goals, in any field of endeavor should stand out so clearly and so brilliantly that they will never be lost sight of for a moment. In education all school activities should make very definite and direct contributions towards the accepted objectives.

Objectives will not be realized, however, until those interested in having them achieved make a careful analysis of each and determine just what information, experiences and situations are necessary for their realization. Too often, particularly in the field of education, we set up objectives and then forget about them and continue to emphasize subject-matter facts and skills for their own sake.

Perhaps the one major objective in all education is to make desirable citizens of youth. This goal may be broken down into many which are concrete and easily understood. For secondary education one school system has set up two objectives with their many implications. The first one is "to develop a fundamental faith in the American ideal of democratic government as an opportunity for people to live together successfully and happily, and to develop those attitudes, skills and understandings which will enable the individual, as a member of the social groups concerned, to become a force in the process of its achievement."

To realize this aim the school must provide experiences which will give the students an understanding of the democratic method and a knowledge of the social, political and economic problems of society and how these problems may be solved through cooperative effort. Students must learn to think critically and independently. They must learn how to be good followers as well as good leaders, for at times each is a follower and each is a leader regardless of his social and economic status.

To read about and discuss the many issues confronting a people are not enough, as desirable and essential as these are. Provision must be made for a participating experience, if a true understanding is to be had of the significance of democracy.

The extra-curricular activities and games provide participation for a limited number of students. But it is the industrial arts shop which provides a situation where every boy participates each day either as a leader or a follower. This is accomplished when the teacher sets up an organization for control and operation of the shop by students, whereby each week the students are rotated from one responsibility to another. By this means training is given in supervision and in working under fellow students as well as in working with one another in a close relationship. The very na-

ture of a shop set-up requires coöperation among all students if effective work is accomplished and harmony prevails. Friction will appear and the wise teacher will use the situation to bring forcefully to the attention of the members of his class the principles of democracy and what the conduct of each must be to achieve the democratic way of living. The infrequent visitor and the casual observer will seldom see the fine training in democracy which is going on in every well-organized industrial arts shop.

The second objective is "to develop an effective personality through an understanding of self and through an appreciation of the importance of the aesthetic and the spiritual in human activities." This aim implies that the schools are responsible for giving the individual experiences which will permit him to develop mental and physical health.

The industrial arts department makes its contribution to this objective by setting up learning situations whereby the student is required to use the scientific method of thinking every day, and whereby he is made conscious of the thinking procedure by his instructors. Going through the process in every job, and being aware of the steps each time, the method becomes a habit and he will soon learn to solve most of his problems of a similar kind, and there are many of them, to his satisfaction, thereby helping to develop mental poise and mental health. Every job in the shop requires careful planning, evaluating and testing.

The medical profession and the psychiatrist have long recognized the therapeutic value of creating things through the hand. While they have used craft work as a cure, it is just as effective as a preventative. The industrial arts again makes its contribution.

The shop program gives the individual some skill in the use of tools and a knowledge of materials, so that he may become interested in establishing his home workshop. Thousands of home workshops are established every year. In these laboratories both son and father may satisfy their creative urge. Creative work of this kind has both aesthetic and spiritual values.

This objective also infers that the schools must recognize the individual differences in children, not only as to mental capacity but as to interests and aptitudes. If they do, then the industrial arts meets the needs of a large percentage of the youth in all secondary schools. Too often it is assumed that all students with a high intelligence quotient are interested only in academic subjects. Where schools provide free electives and the student is uninfluenced by teachers, either for or against any particular subject, experience shows many of these boys elect industrial arts because of their interest in and aptitude for this phase of education. Schools must offer opportunities in the field of industrial arts if they are to satisfy the interests and care for the different aptitudes of the students under their care; by so doing the boy is also assisted in the selection of a vocation.

One phase of the aesthetic in life is an appreciation of form and color. In man-made things art has become more and more an important element through structural design, contour en-

richment, and surface decoration. To appreciate the beautiful the student requires knowledge of the principles of art and an opportunity to apply them. Abstract art is like any other abstraction, ineffective unless applied. The industrial arts, whether in metal, wood, clay, or any other medium, provides an excellent opportunity to learn and apply the basic principles of design, particularly structural and contour enrichment.

From this experience the pupil will have a greater appreciation of beautiful homes, ecclesiastical, commercial, industrial and public buildings and their furnishing, and thereby derive much more from life than he would otherwise. It is also quite likely that he will buy the things for his personal use with greater discrimination for the beautiful.

An effective personality in a democracy is one which contributes something toward the total welfare of society by producing something that society needs. To do it the schools are under obligation to assist each one in becoming vocationally competent. The industrial arts perform this task, in part, for the large number of boys whose formal education ends during the secondary school period or at the close of it.

Therefore, industrial arts have not only cultural value for all, but vocational significance for a large number of the youth of our land.

EXTRA-CURRICULAR EXPERIENCES IN THE PROFESSIONAL PREPARATION OF INDUSTRIAL-ARTS TEACHERS

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Dr. Bawden has developed a unique program of extra-curricular experiences in teacher training which will be suggestive to others interested in the professional training of industrial arts teachers.

A FACTOR of great importance to successful shop teaching is being able to give a rational explanation of what industrial-arts instruction aims to do for the boy, and, in particular, how the teacher expects to accomplish these results in his shop. It is not sufficient for the teacher to display the outline for a course of study which he secured at the teachers college, and a list of tools and machines taken from a manufacturer's catalog. When the superintendent or principal, and the parents of some of the boys, and the newspaper reporter, call for an explanation, the teacher should be ready to talk about his plans simply and convincingly, and to tell why he has selected these means to accomplish these ends.

This demand to explain and interpret his work falls upon the teacher of industrial arts more frequently than it does upon the teachers of certain other subjects, and perhaps with a different emphasis. There are fewer occasions for raising questions concerning the status of the older and more established studies, which are generally accepted as a matter of course. When such questions do arise, almost any member of the faculty is ready to accept the challenge Industrial arts, as a comparative newcomer in the curriculum, does not possess this advantage. Unless it is presented by a teacher who is unusually wide-awake and alert to the possibilities of creating friends through services rendered to other departments, it is likely not to have a champion to come to its support in some hour of crisis.

Another of the major problems of the field is the isolation of the industrial-arts worker. This stands out conspicuously as an obstacle to progress, whether we take a broad view of the sweep of more than a half-century of struggle since the pioneer trail-blazing of Dr. Woodward and his contemporaries, or whether we contemplate the conservative estimate that fewer than one-fifth of all the public high schools in the United States, as at present organized, can be expected to employ more than one instructor of industrial arts. From the beginning of the movement to the present time, in the vast majority of high schools, the industrial-arts instructor has worked and is working alone, without the aid of a colleague to support and counsel him when crises arise, or when important decisions must be made. When this circumstance is coupled with the observed tendency to eliminate both subject and

instructor when mistakes are made, the gravity of the situation is obvious.

The problem extends beyond the isolated shop teacher in the typical small high school, and makes itself felt in the large city school system, and in the teacher-training institution as well. The superintendent of schools in the large city must rely upon the judgment of the supervisor or director of industrial arts, and the president of the state university or teachers college must be guided by the recommendations of the head of the department in the solution of many problems requiring the application of specialized knowledge, skill, and more particularly, experience. In many instances, city supervisors and college heads of departments seek the advice of others holding similar positions of responsibility before arriving at important decisions.

The limitations of this paper permit mention of but one more of the major problems of the industrial-arts teacher. As an important contribution to the accepted task of public education, namely, to prepare young people for complete living in the United States today, we have set up as one of the chief aims of industrial arts: "To develop in each pupil an active interest in industrial life and in methods of production and distribution." [1]

An examination of this aim and of the means now available for realizing it, raises at once the question which is fundamental to any program of guidance in the public school with respect to future vocation. Very few teachers have had personal experience in any vocation besides teaching. How can any teacher offer the child more than the most superficial guidance, in view of the hundreds of possible vocations? How can the industrial-arts teacher develop in the boy knowledge about and interest in modern industry unless he himself possesses at least a minimum background of personal knowledge about and interest in modern industry? The answer is that not much that is worth while will be accomplished unless special effort is made to arouse the interest of the teacher, and to supply him with the necessary materials and techniques.

Years of study of these and other problems that might have been included, and innumerable conferences with others who have been engaged upon the same problems, afford the background for a concerted effort to ameliorate these conditions, which has taken the form of a series of projects in the Graduate Division at Kansas State Teachers College, namely: the weekly dinner-conferences, the annual industrial education tour, and the annual radio broadcast.

The Dinner-Conferences

Beginning in the Summer Session of 1933, there was established as one of the major projects of the summer's work a series of weekly dinner-conference programs, participation in which is part of the work required of students enrolled in graduate courses in industrial arts. A detailed outline of the project is furnished to the student in the form of a manual, which describes the plan of the meetings, analyzes the factors of success of such a

1 "Standards of Attainment in Industrial-Arts Teaching," page 14. Report of A. V. A. Committee, December, 1934. American Vocational Association, Washington, D. C.

meeting, and describes the duties of each member of the committee.

The project is carried on by means of these committees, and a meeting is held each Tuesday evening for eight consecutive weeks. Each week a different committee is in charge of the meeting, each member of the committee having his own specific assignment, as well as the general assignment of committee membership. The members of the committee, and their assignments, are as follows:

1. *Chairman.* Serves as chairman of the committee in planning the program; also, presides at the meeting and conducts the proceedings.

2 and 3. *Speakers.* Two assignments. Select a topic, and open the discussion with short addresses of not over 12 minutes each. Reading of papers not permitted.

4. *Summary.* At the conclusion of the general discussion, summarizes the discussion by emphasizing a few of the most significant contributions.

5. *Parliamentarian.* Takes charge of a short business session as presiding officer *protempore,* and with the assistance of a number of volunteers, conducts a prearranged "order of business," designed to afford practice in the application of the rules of parliamentary procedure.

6. *Critic.* Just before adjournment offers constructive suggestions on the planning and conducting of the meeting.

7. *Arrangements.* Is responsible for the physical conditions, posting of bulletins, distribution of mimeographed outlines, checking of attendance roll, and the like.

The meetings are planned with a dinner scheduled at 5:15 p. m. Following the dinner, there is usually about ten minutes available for group singing. Promptly at 6:00 o'clock, the chairman raps for order; the two main speakers open the subject, speaking from mimeographed outlines which are distributed to all present. This is followed by from 30 to 45 minutes of general discussion from the floor, in which all graduate students are expected to participate. An outline of the topic, with selected bibliography, is posted on the department bulletin board one week in advance of each meeting to encourage preparation.

At the conclusion of this portion of the program, the "summary" man makes his report. The gavel is then turned over to the parliamentarian, who calls the business session to order, appoints a secretary, and proceeds with the transaction of business. This is followed by the report of the critic, announcements concerning the next meeting and the like, and adjournment

The specific aims of this project may be stated as follows:

1. To provide experiences which will develop increased personal facility and sense of responsibility in planning, conducting, and participating in professional meetings.

2. To promote personal ease of bearing and self-command in appearing before an audience and speaking effectively on the objectives and program of industrial arts.

3. To provide experiences which will stimulate the development and exercise of qualities of professional leadership on a practical, laboratory basis, permitting observation, study, and discussion for mutual helpfulness.

4. To provide opportunity for informal discussion and solution of problems of common interest to shop teachers.

5. To provide experiences which will effectively supplement the activities connected with prescribed college courses in preparing teachers to meet the responsibilities of their positions.

The entire responsibility for planning and conducting the meetings is thrown upon the students, in consultation with any advisers they may select. The chairmen and parliamentarians are chosen from the upperclass men, so that the more experienced men are always in the key positions. Otherwise the assignments are made by lot, and every student receives at least one assignment.

The significant elements in this project are actual practice and participation in activities in which so many industrial arts teachers in the field are comparatively weak. The situation approaches as closely as possible the conditions in a typical professional meeting of teachers. The student who completes the work for the master's degree in four summer sessions has the opportunity to attend eight such carefully planned meetings each summer, or thirty-two in all; theoretically he has opportunity to take some part in all, but in practice he probably functions in about half of them; he has opportunity to become thoroughly familiar with the technical details of planning and conducting meetings, and he comes to understand the necessity for attending to these details. And, most important, he has opportunity to overcome the initial handicap of nervousness before an audience that most of us are obliged to struggle with, and to gain some degree of poise and self-confidence, the value of which it is almost impossible to measure.

One invaluable outcome of attendance upon a series of conferences of this type is a new sense of solidarity that tends to offset, in part at least, the feeling of isolation and lack of support that is characteristic of the industrial-arts teacher who works alone in a small high school. Listening to and participating in the discussions, he comes to realize that he is not simply a lone worker struggling along without the benefit of expert guidance on his job, but he is also part of a great body of upstanding, progressive teachers. Other teachers are working upon the same problems that have engaged his attention, and he acquires a new self-confidence through the discovery that others have arrived at some of the same solutions and devices that he is using, and he adds perceptibly to his personal store through the exchange of ideas.

The Annual Industrial Education Tour

A second major extra-curricular project of the Summer Session is the annual industrial education tour. For this purpose metropolitan centers within convenient driving distance from the college are selected.

A brief description of the 1937 tour will suffice to explain the project. The head of the department serves as the director of the tour, and selects the city to be visited, through preliminary correspondence with the superintendent of schools and supervisor of industrial arts. A committee of five students is appointed, including

at least two who have served on similar committees in previous years. With three or four members of the committee a visit is made to the entertaining city on the first week-end of the Summer Session, for a conference with the supervisor and members of his staff, to decide on the industrial plants and school shops to be visited, to determine the route to be followed, with a schedule of arrivals and departures, and other necessary details.

The school authorities in the entertaining city make the necessary arrangements for the visits to the industrial plants, including guides, and for visits to the school shops, including someone to describe and interpret the program of instruction carried on in each shop. A mimeographed bulletin explaining the aims of industrial arts, the program, and personnel in the city schools, is prepared and distributed. The local committee also prepares a program for a dinner meeting, held on Friday evening.

The department at the college prepares mimeographed outlines of plans for studying and reporting on school shops and industrial plants, and conducts preliminary discussions on how to secure the maximum benefits from the visits. Arrangements are made for transportation, for hotel and garage accommodations, and for special meals as needed.

This year the party consisted of 42 graduate students and three members of the faculty. Promptly at 1:00 o'clock on the day set for the trip, the party left the campus, traveling in a caravan of private automobiles. Arriving at the hotel in the chosen city shortly before 6:00 o'clock, the men were assigned to rooms promptly, in accordance with a schedule previously arranged by correspondence. At 8:00 o'clock we reported at a steel plant, which is now operating twenty-four hours a day. Here we observed the manufacture of a variety of special equipment for the oil-fields. We were divided into groups of six to eight, with a guide for each group. At 10:00 o'clock we returned to the hotel.

The next day we spent two hours in a trip through a modern cotton mill manufacturing sheets and pillow-cases, followed by about an hour in a glass plant, where we observed the manufacture of glass fruit-jars by modern mechanized processes.

After lunch we spent about two and one-half hours in a personally conducted trip through a refinery. This was followed by a visit to the shops of a large junior high school.

At 6:30 p. m. we attended a dinner and special program arranged by the Manual Arts Club of the city. On this occasion we had opportunity to meet delegations which had been invited from the State A. and M. College, another state teachers college, and a number of city schools of the surrounding territory.

On Saturday morning we visited school shops in a senior high school and one other junior high school. After lunch we were taken for a two-hour tour of the city and environs, including visits to the city university, a residential district, the municipal airport, and a park. At 4:00 o'clock we left for the return trip and arrived home about 9:15 p. m.

Experiences of Four Summer Sessions

In four Summer Sessions the graduate students visited fourteen distinctive industrial plants, under the most favorable conditions for observation and the collection of useful information. They visited fifty-four industrial-arts shops and drafting-rooms in seven senior high schools and six junior high schools, in four large cities, in three different states, with reasonably complete and permanent notes on equipment, shop organization, and teaching methods and devices.

They visited five college and university campuses, and met representatives of faculties and students from four other teachers colleges.

The special advantages derived from the Industrial Education Tours, which contribute directly to improving the efficiency of instruction and to broadening the vision of the teacher of industrial arts, may be enumerated as follows:

1. Opportunity to gain first-hand knowledge of modern industry and of methods of production and distribution.

2. Opportunity to assemble and organize data on industry and industrial processes, to be used in talks to boys in high school classes.

3. Observation and experience in methods and devices used in planning and conducting an industrial tour.

4. Opportunity to study shop layouts, and methods of organizing and equipping school shops for a variety of purposes, under a variety of conditions.

5. Opportunity to study a considerable variety of teaching materials and devices.

6. Opportunity to extend personal acquaintance among teachers, supervisors, and other leaders in four principal cities in three states.

The Annual Radio Broadcast

The third major extra-curricular activity of the Summer Session is the Annual Industrial Education Radio Broadcast. This is one of a series of weekly broadcasts sponsored by the college. In this instance it takes the form of a symposium, contributed by students of the department.

During the past summer the graduate students were classified conveniently in three groups of approximately equal numbers: first-summer men, second-summer men, and the remainder. Three speakers were selected from each group, by means of a preliminary competition, and the nine papers were organized in a fairly unified program.

The assignment consisted of the writing of a paper, which can be read aloud in not less than four minutes and not more than five minutes, on some phase of the general topic: "The Educational Values of Industrial Arts." In class, we talked over a number of sub-topics, the treatment of which would be suited to the general radio audience, the purposes being to explain what we mean by industrial arts; to tell something about our aims, courses of study, methods of teaching; or to describe the changes which we see taking place in boys who receive the benefits of this instruction in an up-to-date high school. The student is encouraged to prepare a paper such as he might read before his high-

school assembly next semester, or before a P. T. A. meeting, or possibly in faculty meeting.

The three winners in each group were chosen by ballot, as the papers were read aloud in class, all members of that group participating in the balloting. One final rehearsal was held, to make sure that the entire program came within the time limit of forty-five minutes.

The values derived from participation in this project are:

1. The experience of preparing a short paper on an assigned topic, and reading it before an audience.

2. The experience of friendly competition.

3. The experience of listening to the development of a considerable variety of ideas on the same general topic.

4. For the nine winners, the experience of appearing before the microphone in a radio broadcast.

Conclusion

It should be emphasized that the primary aim of the extra-curricular projects is to offer certain types of training and opportunity for development which can be provided in the usual college course and classroom only with the greatest difficulty or not at all, and which are regarded as contributing an essential part of the personal equipment of the industrial-arts teacher. Practically all the topics which have been discussed in this paper may be studied and analyzed and theorized about, but the values that come to the mature and serious-minded teacher of industrial arts through participation in a series of lifelike *experiences,* such as afforded by the projects herein briefly and inadequately set forth, cannot be acquired in the classroom. They are not included in any textbook; they are not gained through any number of library assignments; they are not absorbed spontaneously or automatically or through the usual college procedures.

AN INTEGRATED PROGRAM OF INDUSTRIAL ARTS FOR A SMALL CITY

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Mr. Simon has developed an unusual and highly effective program in Champaign, Illinois, whereby the combined equipment of two modern school plants are utilized in an integrated program of industrial education.

IN the development of an integrated program of Industrial Arts, it is first necessary to consider the objectives of Industrial Arts in the light of the philosophy of industrial education and education in general.

Many of our national problems, such as child labor, juvenile delinquency, unemployment, increased poverty and misfits of all types in the social scheme, have developed because our educational system has not adequately provided training to equip our youth to fit into the ever-shifting scene of civilization. We are just beginning to realize that it is not possible to fit all youth into the same mold and thereby achieve our purpose — an upright citizenry with which to meet the problems of a strife-torn world.

Education must emphasize both the individualization and socialization of the pupil, and in the former ideal we aim to teach him to think of himself as an individual with certain attributes peculiar to himself alone, to realize that he has special inclinations, talents and abilities which should be developed to the fullest extent; and to recognize he has weaknesses for which provision should be made if his maximum development is achieved.

In order to accomplish this ideal of individualization in education our purpose must be fourfold:

1. To stimulate the pupil to become aware, not only of himself, but of the world to which he belongs. He must be made to sense the vital importance of the health laws; to arouse an intellectual curiosity and a desire to know his environment, and knowing it, to adjust himself to it and to its demands of him; to effect a change in that environment which would contribute not only to his own welfare but to that of the whole community.

2. To encourage the pupil to develop an open mind—an attitude of toleration toward new ideas, until he has, through his reasoning, evaluated them for their apparent worth.

3. To encourage the pupil to widen his sphere of interest in order to include avocational as well as vocational activities. Such interest must eventually lead him to use his leisure time to a greater advantage, both for his own satisfaction and for the enrichment of the social group.

4. To prepare the child for the business of living by training him in the skills which will be necessary in procuring an adequate share of the necessities and comforts of existence.

In recognizing individual aptitudes and capacities, we must provide for those individual aptitudes and capacities and make a supreme effort to adjust each pupil to his environment, by training him along the lines of endeavor for which he is best suited.

Children who are doing the thing they are interested in doing, seldom become delinquent and seldom drop

out of school. It is the duty of the state to provide such resources as shall be necessary to train its youth; so that, by maturity, each will have acquired a foundation and stimulus for further progress in his chosen field. Only thus shall we develop efficient workers and happy and useful citizens.

However, the individualization of the student, in itself, is totally inadequate, since man is by nature a social being. Because he is a member of various social groups, he must have the kind of training that will fit him for social life, and as a foundation for this training he should have a knowledge of the basic contributions of our social heritage — the foundation stones of the present structure of society. He should not be forced to worship the past for the sake of the past itself, but led to appreciate it for the sake of gifts to us, since our culture is the result of the efforts of countless past generations. Therefore, it is necessary for us to direct the attention of the pupil to the issues of the present, which he may better understand and interpret through his study of the past. He will, in his mature years, have many problems to face which past and present situations have created.

His knowledge of historical development should furnish him with a better basis for intelligent decisions. But mere knowledge is not enough. Life is a matter of adjustment and adaptation, not only to the physical environment, but also to the behavior of other members of the social group. The pupil should early be made to realize that it is by the interdependence of the members of the group that he lives and thrives. In order to make this interdependence as effective as possible — such qualities as the coöperative spirit, responsibility, respect for authority, personal integrity, and a desire for social betterment must be present in the individual. No comprehensive program for social betterment or civic improvement is possible without them.

In addition to being trained as a social-minded individual, he should be able to recognize the existence of social emergencies and his responsibility toward their solution.

Hence, the aim of education should be to develop in our pupils valuable social attitudes as well as individual effectiveness.

Thus we see that Industrial Education has a very important place in modern education, because the activities concerned with the furtherance of the Industrial Arts of the world are so closely connected with so many phases of human life from both the producers' and consumers' standpoint. The public schools exist for the purpose of developing useful citizens. Twentieth century industrial activity has made it imperative that every citizen understands the fundamental principles of the machine age, and Industrial Education is the most satisfactory means of presenting this information. The modern world, with the growing perplexities of manufacture, transportation, mining, building, etc., makes it imperative to provide for these experiences through school-created conditions, so that the pupil may realize his special inclinations, talents and abilities, and develop them to the fullest extent.

In addition to widening the student's sphere of interest, he must also

be made to realize his weaknesses in order to include avocational as well as vocational activities, and to prepare him for the business of living by extensive training in the skills which will be necessary in procuring an adequate share of the necessities and comforts of existence. We must also make a supreme effort to adjust each pupil to his environment by training him along the lines of endeavor to which he is best suited, so that by maturity he will have acquired a foundation and stimulus for further progress in his chosen field.

Because the foundation stones of the present structure of society are based upon the social heritage of the past, and the greatest human progress within the last one hundred years has been made along technological lines, education cannot ignore the study of industry and industrial life. This can be best secured by first hand experiences in production work, taken from that field of human experiences which are concerned with the methods and processes by which the natural resources of the earth are secured, treated and transferred to meet human needs and desires.

Thus, in Industrial Arts we are not attempting to produce more carpenters, cabinet-makers, auto mechanics, or electricians, but we are trying to give the boys industrial information, appreciation of good material and workmanship, instill desirable traits and attitudes toward the worker in industry, give some basis for an intelligent choice of an occupation, develop an intelligent consumer and utilizer, and develop some skill in the use of common tools, whether that be for handyman activities or for leisure time interests.

Most educators will probably agree with these objectives and the underlying philosophy, but the organization of the work to bring about the realization of these objectives most effectively and economically presents a serious and difficult problem in the average small city. The enrollment and size of the schools does not permit the duplication of equipment and provision for all branches of industrial arts in each school. The space in each school is usually limited to but two or three shops and a small staff of teachers. Most cities attempt to solve this by setting up the industrial arts program on a general shop basis.

In our set-up in Champaign, Illinois, we favor the unit type of organization. We feel that it has many advantages over the comprehensive shop plan.

The teacher is able to specialize or concentrate upon type of work, or at least in one broad field of work. The shops can be better equipped and the duplication of equipment is eliminated. The shop becomes more nearly representative of the industry and, last but not least, the junior and senior high school Industrial Arts program may be more effectively integrated in a manner not possible when the shop work in the senior and junior high schools are separated.

In our industrial arts set-up, both the junior and senior high school shops are used for shopwork, whether that work be junior or senior high work. This was done because space allowed for in the junior high school shops was only large enough for two shops. Instead of equipping these two shops

as woodshops or general shops of the junior high school level, it was decided to equip them as unit shops in those branches of industrial arts which could not be provided for in the senior high school shop units, and to use all the shops for all industrial arts work taught. That is to say, it was felt that it was better to provide six different shops than two general shops or woodshops in the junior high school with continued work in the senior high school in printing arts, mechanics, woodworking and drafting.

We have set up eight units, representative of eight basic industries, namely: electricity, wood, print, metal, auto, drafting, foods, and textiles. These basic industries serve as a basis for our industrial life.

Our industrial arts work may be divided into three stages or levels, namely:

1. The introductory and exploratory level.
2. The finding and try-out level.
3. The advanced industrial arts level.

The introductory industrial arts work is offered in the seventh and eighth grades. These courses consist of three courses of twelve weeks each, two ninety-minute periods per week, in woodworking, drawing, and general metal work in the seventh grade; and three more courses of twelve weeks each in auto-shop, electricity, and printing in the eighth grade. The purpose of these courses is introductory in nature and very elementary. As, for example, some of the things a boy is taught in these preliminary courses are:

1. *Drawing:* Make simple mechanical drawings or sketches, learn to read simple blueprints used in various industries, etc. Various interesting topics are discussed and illustrated, such as: the architect and his drawings, tools and the tool designer, etc.

2. *Electricity* includes not only many applications as found in the home, but also found in industry, communication, transportation. Safety rules, and care of home equipment is provided, and the students do simple jobs, such as the making of a compass, toy motor, toaster, etc.

3. *Metals:* This consists of work in cold metal, sheet metal, soft metal molding. The student studies the production of each metal and understands where and under what conditions ore is produced. Articles such as ash trays, paper weights, wrought iron lamps, spun books, etc., are constructed.

4. *Auto Shop:* This will involve a study of the working parts of a car, economical maintenance of an automobile. Particular emphasis is placed upon the care and operation of a car, and safety rules and regulations.

5. *Woodworking:* A study of furniture manufacturing, forestry, lumbering, carpentry, how patterns are made and simple projects are constructed.

6. *Printing* familiarizes the student with the industry of printing, its requirements and possibilities. It is not taught to make printers of boys. Education is the first aim, rather than production. It enables the student to learn about paper, kinds, sizes, manufacture; how to set type; how to make proofs; how to correct them.

7. *Foods:* The foods course for boys includes information on nutrition and cleanliness and care and refrigeration of foods. The boys also learn how to prepare a simple breakfast and lunch, and they also receive information about those trades which have to do with the preparation of foods, such as, baking industry, hotel chef, grocery store, etc.

8. *Textiles:* In this unit the boy is taught how to choose his clothes intelligently, consideration is given to what to look for in buying, how to judge cloth and color, how to recognize values, styles, textures, etc.

A course in Household Mechanics is also given to all girls in the eighth grade. This course is offered one ninety-minute period per week.

In the ninth grade the work is elective and students are permitted to choose a semester each of any two of the six basic branches offered in the seventh and eighth grades. These courses are in the nature of try-out and finding courses. Records are kept of the students' likes and dislikes, abilities, industry, and other factors. These courses are offered ninety minutes daily.

In the tenth year the student in this year is permitted to continue with any one of the courses chosen in the ninth grade, or he may elect a semester of any of the others. If he so desires he may enroll for three clock hours and continue the work in a vocational course in woodworking, electricity, or auto mechanics.

The background of the boy is enriched with information affiliated with his manipulative activity in particular, and with the field of industry in general, by the uses of various teaching devices, such as: demonstrations by the teacher, experts or students; class discussions and lectures by teachers or others; information sheets; experiments performed either by the teacher or students; visits to the industries and museums; movies; slides; working models; oral or written reports; special investigation; samples prepared by students or teacher; posters, charts, cartoons and dramatic presentations; photographs; contests; projects; tests; free industrial materials; note books; correlation with other subjects; clippings and scrap books; blueprints; textbooks and other references; conferences with teacher, and interviews with business men, engineers, etc.

By the above devices the industrial arts work is also integrated with the other school subject matter as the presentation of informational topics. The following are suggestive of the scope covered:

1. *Design.* Structural and esthetic design of industrial products. Examples: Recognize styles of architecture, choose pleasing color combinations, determine good proportions in a selected project.

2. *Mathematics.* Necessary for shopwork and definite illustrations of work being taught in the mathematics class. Example: Board measure, figuring bill of material for a selected project. Determine, light, gas and water bills, fractions as applied to bit and drill sizes, factors entering in a determination of the cost of a selected project.

3. *Economics* of industry, concerning the values of time, labor, materials, products and industry as a whole. Example: Upon what basis the value of a house is determined.

4. *Science,* both natural and applied, which is closely related to work done in the shop. Example: Action of stains on woods, commercial products made from trees, metals in the home, fundamental parts of an automobile, cross-section of a log, methods used in mining and smelting ore, the chemical and mechanical generation of electricity, manufacture of paper.

5. *Geography and Transportation* of materials and products. Example: Principal transportation routes of raw materials, tracing of sources of lumber used in making projects, methods of transporting lumber.

6. *History.* Discoveries, inventions, prominent men in industry. Example: Outstanding electrical discoveries and inventions, history of printing, of light, primitive tools, history of the house, evolution of communication.

7. *Consumer Values.* Factors in evaluating furniture, house insulation, protecting metals against rust, how to select, use, care for and repair household appliances, automobiles.

8. *Sociological Aspects.* Example: Relationship between shop foreman and worker, pupil management.

9. *Safety and Hygiene.* Safety instruction in the proper use of equipment, proper dress for work.

10. *Occupational Information* having guidance significance. Example: Visits to newspaper plant, woodworking mills, lumber yards, etc. Tools, materials, processes of several important trades and semi-skilled occupations, what the worker does, acquaintance with the general characteristics of the work done in the field of mechanical occupations as contrasted with other fields.

11. *English.* The importance of good English, both oral and written and through such items as spelling, punctuation. Reports on various phases of work and through print shop instruction.

Thus the Industrial Arts work emphasizes not only the manipulative processes, "The Things a Boy Should Be Able To Do," but also stresses the information aspect, "The Things a Boy Should Know," and inculcates in the student desirable attitudes, habits and ideals, through the emphasis of "The Things a Boy Should Be."

ADAPTING THE COURSE OF STUDY

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In this article Dr. Fryklund gives a concise and practical analysis of an important aspect of course-planning and organization. It is a phase of organization that is frequently neglected.

A PROBLEM that frequently confronts those who are organizing a course of study in industrial arts is that of determining the length of a course for a given grade. This is important and it cannot readily be answered by deciding upon a number of projects that would constitute the work for a school term in a particular grade. A suggestion for determining the length of a course of study should be of value, although any device assumed to overcome the natural differences in abilities of individuals has its shortcomings. Even mathematical prediction is frequently in error when used in attempting to determine in advance the oft-times mysterious reactions of human nature. The best means by which to determine what an individual might do is to judge by his performance in the past, and even then there may be deception arising from the unexpected.

At the outset, the course of study should be based upon aims, and consist of a list of instructional units stated in terms of fundamentals of manipulative and informational nature. The instructional units in manipulative work should be based on operations or skills. The nature of the units of informational content would depend upon the topics. The fundamentals are the things that must be taught by the teacher and learned by the student. Projects are necessary also because they serve as vehicles for the application of the instructional units. The fundamentals applied in suitable projects are the fundamental instructional materials that are assumed to contribute to the realization of the aims of the subject-matter field and the aims of education in general.

A common difficulty in course organization and in teaching, and a serious one, is that many teachers in all areas of education fail to distinguish clearly what defines the work of the teacher and what defines the work of the learner in relation to the instructional units and the typical problems of which the instructional units, in some combination, form a part. Proper orientation at this point has much to do with the usefulness of the course of study. What the teacher is expected to teach forms the basis for the course of study, and what the pupil is expected to contribute completes it. The former can and should be determined in advance and controlled by the aims of the course. The latter, being dependent upon human peculiarities, is difficult to predict. The learners' contribution is flexible and difficult to determine in advance. It might also be said that a course has not been definitely conceived until the time limit for the course has been tried in instructional experimentation.

When teachers have clearly in mind that their duty is to teach the funda-

mentals to the learners by whatever means is necessary for the occasion, an important step has been taken in successful course organization and successful teaching. The learner should not be expected to learn the fundamentals by chance. Life is too short to expect students to rediscover what has already been discovered. The fundamentals should be taught with *illustrations of application.* Then comes that part, the learning, for which the student is responsible. He should be held responsible for the recognition of need and applications of the fundamentals in problems; *he should do the problem solving.* This is the method of those who create. Few things have been created that have not been based upon principles and fundamentals that were learned in the past. The new consists of old things arranged in new ways; it is an outgrowth of the old.

Inasmuch as the course of study should include the fundamentals or learning units, and since it is now generally agreed that all phases of a course of study should contribute to the aims of education, the units should be determined in advance, if they are to function according to a plan. They constitute that portion of the course that can be predicted. The remainder of the course is of psychological nature. It is the part that the learner contributes and which cannot be readily predicted. The selection of projects is a matter of choice for the learner, and it involves a degree of control by the teacher, so the projects will be within the limits indicated by the aims of the course. There should be freedom, however. This is the flexible portion, through which the teacher leads and guides the learners thoughtfully toward the realization of the aims of the course and the aims of education, and at the same time satisfies individual desire.

If the best means for determining what an individual may do in the future is to judge his performance in the past, it would seem that such procedure would be useful in determining the length of a course of study for a given school level. It would be exceedingly difficult to conceive a course of study in length and scope for a particular city before one has come to know the learners, city, section of the city, funds and equipment available. Anyone who has been trained in analysis and modern curriculum and course organization practices will agree that without such knowledge only something broadly tentative can be conceived.

To determine the length of a course of study, therefore, there must be dependence upon past experience. There must be a list of instructional units stated in terms of the fundamentals to be taught. A progress chart should be kept, on which appears the names of all the learners of the class for one term and the names of all the fundamentals, of both manipulative and informational nature. The usual procedure for checking achievement on a progress chart should be followed. That is, as a learner attains proficiency on a particular unit, it should be checked on the chart. At the end of the term the total number of units covered by each student should be determined. Then the total number of units covered by *all* learners in the class should be obtained. These

should be divided by the number representing the class size and the quotient will represent the average number of units covered by the class in question for that term and in that school. For example: suppose that one learner attains proficiency in 34 units; another 27 units; another 21 units; another 23 units, and so on. There are 32 learners in the class. Add the total number of units covered by all members of the class and divide by 32 and the quotient will be the average unit accomplishment for the class.

By repeating this procedure under the same teacher for three or more terms, the average expectation in length of course can be obtained for a given grade in a given school under certain instructional conditions. If the average number of units for the first term was 24, second term 27, third term 29, fourth term 20, the average for the four terms would be 25. Under conditions similar to those under trial, it can be said that a subsequent class can be expected to attain proficiency in approximately 25 units.

Adaptation of a course of study is individual and affected by many variables. Length of a course in terms of units, therefore, cannot readily be determined, even with approximation, for any other teaching situation than the one under consideration.

THE REORGANIZATION OF INDUSTRIAL EDUCATION IN THE CHICAGO SCHOOLS

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Dr. Newkirk has described in this article one of the most interesting programs of elementary school hand-work developed in the United States. As Director of Industrial Arts and Elementary Science in the Chicago schools he is chiefly responsible for the program described.

THE industrial education program in Chicago is complex and has been developed to meet a variety of educational needs. The program has been built up over a period of years through the efforts of many men and women interested in better educational opportunities for Chicago's boys and girls. To attempt a description of the varied phases of the program in detail would require many pages and thousands of words. The industrial education program is as extensive and varied as the educational program itself. It is constantly being modified or reorganized at one or more points in order to keep the instruction in step with changing educational policies and varied social and economic conditions.

Chicago stands second in the world in the number of shop and drafting courses taught. Chicago's boys get a valuable part of their cultural and vocational education from the school shops and drafting rooms. Over 50,000 boys took shop and drafting courses in our 37 high schools during the school year 1936-7. Over 370,000 boys and girls had an opportunity to use craft work as an integral part of their learning in the elementary schools. Several thousand boys and girls took courses in our day vocational schools. Over 5,000 adults took industrial education courses in our six evening high schools. Special courses in the crafts are provided for deaf-orals, crippled, truant, and mentally handicapped children.

Although there is a constant reorganization of the industrial education program in all progressive city systems certain trends have been evident during the past few years in Chicago. The industrial arts work in the elementary school has been integrated with all school subjects and often used as a technique of instruction. A new industrial arts laboratory has been developed for the ninth grade. Vocational education and special education have been expanded. High school shop courses are being given careful study and new curriculum developments are under way. All of these trends are the result of administrators and teachers coöperating to provide types of education better suited to meet the educational challenge of today.

It is my purpose in the remainder of this article to describe briefly some of the trends in our industrial education program. First, let us consider the integrated craft program in the elementary school. The integrated craft work is not considered a special subject but is one of the methods of teaching in the classroom. It is a way of teaching that vitalizes such subjects as may otherwise become empty and formal. It gives the child an opportunity to think vividly and

concretely in contact with realities. The craft work in our schools grows out of the problems in geography, history, arithmetic, art, and other subjects, and is used to intensify interest and promote understanding and appreciation.

The three major objectives of integrated craft work in our elementary schools are: (1) to clarify the child's learning experience in all subjects which are adaptable to the hand work approach; (2) to provide the child with a manipulative form of creative leisure-time expression; and (3) to acquaint the child with a variety of construction material and hand tools.

There are many opportunities for objectifying and illustrating learning in the common subjects of the elementary school and for making valuable contributions to their educative and manipulative content.

In the first grade the child may make a house which is large enough for him to enter and use. He may weave a rug, make curtains, make utensils from clay, construct furniture from crates, and make window-boxes for planting seeds and bulbs during the development of the correlated projects. When the house is constructed the children can use it and its equipment for the study of home living, health and personal sanitation. They can write and tell stories about the family and its members.

In the second grade the farm project is often selected. It leads to experiences outside the home and the child's immediate environment. The farm is usually constructed on a work table. The children can make a barn, house, windmill, silo and fences, and lay out the fields, plant seeds, and model animals and figures. Many of these experiences lead to reading, develop appreciation, give valuable social experiences, and give a natural and effective approach to the study of the farm, its products and our dependence on it for food.

The social studies in the middle grades are specially rich in opportunities for objectifying teaching through the use of craft materials, but the emphasis shifts from the large projects found in grades one to four, to smaller manipulative projects. The correlated problems often take the forms of dioramas, table problems, books, lantern slides, weaving, block printing, and puppetry.

In the upper grades the correlated craft work may take the form of scientific apparatus, models, such as Fulton's steamboat, or model aircraft, marionettes, and pottery.

Over a period of years certain craft techniques have proven of special value. The following craft techniques have been widely and successfully used in the Chicago elementary schools:

Book making
Blue printing
Block printing
Child-sized project
Clay modeling
Dioramas
Lantern slides
Leather tooling
Maps and charts
Metal working
Models and apparatus
Pottery
Paper construction
Puppets and marionettes
Soap carving
Sewing
Table problems
Toy making
Weaving

In addition to the integrated craft program in all elementary grades, the boys and girls are given an opportunity to join a craft club. The craft club is conducted by a teacher of the school, and pupils are permitted to do different types of creative work in the crafts, depending upon their interests. The major objective of the craft club is for leisure time expression. The craft activities conducted in the club are not necessarily correlated with the regular instruction program of the school. They are, however, correlated with the home activities of many of the pupils, and the leader of the craft club gives helpful guidance to those who wish to establish and develop a home workshop.

Next, let us consider the Industrial Arts Laboratory. In order that boys in the ninth grade of the Chicago high schools may have increased opportunity for exploration and guidance in the crafts the industrial arts laboratory is being developed. The industrial arts laboratory is a shop and drawing course designed to interpret the modern industrial and trade world. The industrial arts laboratory is to the study of the industries and building trades what general science is to the study of the sciences. It gives the boy a picture of a large section of the world's work and acquaints him with a variety of tools and building materials.

The guiding philosophy of the industrial arts laboratory is as follows: (1) to assist pupils to interpret intelligently the modern industrial world; (2) to give the pupils first hand experience with the construction materials and simple tools used in industry; (3) to provide methods and procedures which give opportunities for developing social habits and desirable mental attitudes; (4) to provide craft activities for the development of worthwhile leisure time interests and pursuits.

The industrial arts laboratory is a shop and drawing course with instructional materials related to the educational and vocational problems confronting youth of the teen age. It is a practical course with ample time allotment for supervised planning and construction. The class meets for a double period five times a week for two semesters. The major part of the instruction time is devoted to manipulative learning with a variety of hand tools, simple machines, construction materials and supplementary reference books.

The content of the industrial arts laboratory is classified into eight instructional divisions as follows: electric, graphic arts, housing, planning, metal, textiles, ceramics, and transportation. The instructional content of each division is classified into information, experiments, and projects. The instructional material is not formal in nature, but has a variety of suggestive projects and experiments and the pupils are given an opportunity to do other similar projects and experiments not in the course, if they meet their special interest. The type of shop that is used for teaching the industrial arts laboratory depends upon the size of the school, room facilities and the instructional staff. The more common types are the one room, two room, three room, and four room. The one room plan is used in small branch schools where only one room and one teacher are available.

The two room plan is the more common and is used when there are two teachers and two rooms available. The four room plan is used in the larger high schools and the three room plan is an intermediate which is used occasionally to meet special conditions.

In the one room plan all of the instructional divisions of the courses are presented by one teacher. In the two room plan four of the instructional divisions of the class are presented in each room, and in the four room type two of the instructional divisions are presented in each room. In the two, three, and four room plans the pupils are rotated in order that they may have instruction in all of the divisions of the course during the year.

The industrial arts laboratory teacher must have a thorough general education, be able to do a variety of craft activities, have a background in physical science, and be genuinely interested in vocational and social adjustment problems of adolescent boys. It is also desirable to have teachers who are interested in crafts for leisure, so that they can help boys who wish to establish home workshops. Many of our teachers have had experience in boys' camps or in teaching craft work in the parks. Industrial experience is also valuable for an industrial arts laboratory teacher because it gives background for interpreting the modern trade and industrial world.

Vocational education is growing rapidly and is popular with students. Vocational courses are gradually being shifted to the upper grades of the high school. Industrial leaders today prefer boys who are at least high school graduates.

A new trade and industrial school is being planned for Chicago's far south side. The school will not only include adequate facilities for shop and related instruction, but will have a library, an athletic field and a gymnasium. Students will enter the school in their junior year with the express purpose of training for a career in commerce, industry or trade.

A new combination science and industrial arts course is being developed for the seventh and eighth grades in the elementary school. This new course has been installed in forty-two schools and is proving of interest to boys and girls. The crafts and sciences make a valuable combination.

More vocational facilities have been provided for taking care of the needs of the over-age and maladjusted student of less than high school age. Smith-Hughes courses have been added to the technical high schools to provide increased opportunities for vocational education.

The industrial education program in Chicago is continuing its growth. It is making an educational contribution at all grade levels and in the varied types of schools that have been developed to serve the educational needs of Chicago's thousands of school children.

SOCIAL FORCES IN ART

Louis Cheskin
SUPERVISOR OF ART DIVISION OF
ADULT EDUCATION PROGRAM OF W. P. A., CHICAGO

MOST of us have been brought up under the illusion that art is something entirely different from life, that when life becomes boresome or weary, we run to art for consolation. Art being separated from life means of course that the artist is separated from his fellow man.

The artist has been painted as a creature who is different, a person of questionable morals, who lives in an attic and produces inspired masterpieces to gratify his inborn craving for expression. He exists mainly on inspiration which is supplied by a beautiful and delicate damsel and when the opportunity arrives, he partakes of some bread and cheese.

Then one day a wealthy connoisseur discovers his genius and unfolds it to an astonished public. To make the picture even more romantic, the artist's genius is usually discovered when he is on his deathbed, consumed by tuberculosis.

This erroneous and devastating conception of art and artists has been fed to us by the romanticist yarn weavers who were inspired by the pessimistic and inhuman Schopenhauer, who in turn evolved the principles of his philosophy from Kant, a German who created a world in the mind so as to escape the world of reality.

Kant in turn obtained his ideas from Lessing, another German, who wished he were a Greek. Lessing attacked the pseudo-classic French drama of Corneille and Racine only because he desired the original Greek in German art. He considered it very noble to imitate the ancient Greeks but believed it vulgar to follow the contemporary Frenchmen who of course were imitators themselves.

Lessing loved Shakespeare because the repulsive realism in his dramas can be passed quickly. He believed that only beauty should be permanent in art. He said that Virgil represented the 'Lackoon' as crying because the repulsive features in poetry can be passed quickly, but it would have offended the laws of sculpture to show a face with muscles violently distorted.

Lessing, the poet, laid down the laws for sculpture and painting which still strangle many an artist. Lessing denied to the artist what he gave to the poet. He created the germ of escapist idealism which was developed and made very complicated by Kant, a most learned philosopher. Hegel, the follower of Kant's idealism, mostly improved on the master's obscurity, and Schopenhauer, who came next in the German philosophic line, had added to the obscurity a great deal of morbidity.

Winckelmann, who in 1755 published a very learned volume on the greatness of Greek art, not only did much in teaching us the beauties of Greek classicism, but actually attempted to convince the Germans, and even the French, that they should become Greeks. Winckelmann did know that in order to be able to produce Greek art, one must live like a Greek, be a Greek. He not only produced this

absurd idea of Germans becoming Greeks for the sake of art, but made innumerable mistakes about the habits and feelings of the Greeks.

Lessing occupied himself with the aesthetic side of the 'Lackoon', Winckelmann was concerned with the moral. Winckelmann wrote that the sculpture of the 'Lackoon' shows the hero sighing, not breaking into cries, because crying to the Greeks appeared unworthy of a man. The fact is the contrary. The Greeks believed that only a barbarian suppresses the affections and emotions.

Kant believed that there is no reality independent of the mind. If we consider life beautiful, it is beautiful. An idealistic philosophy, indeed; an escape from reality, surely. Hegel and Schopenhauer found life morbid and full of strife, so they attempted to escape from this struggle of realism to the calm, soothing chambers of art. Art, according to these escapists, is a place where the miserable can hide. Art is a drug which causes one to forget reality.

The great Schiller had consumed the Kantian drug. He also scorned the life of his period and longed for the Greek life. Schiller was not a realistic, dialectic thinker, seeking to make his society a better society, but had a sentimental longing for an imaginary state of ideal happiness.

Goethe was also a slave of the classic dogma. In his later years he struggled between the ideals of classicism and the ideals of the incoming romanticism. This struggle is very obvious in his "Faust."

The German idea of art versus society spread over Europe like wildfire and still has a strong hold over European and American artists. There are artists now in America who paint and model Greek gods. Do we believe in the Greek gods as the Greeks did? No! Do we look like Greeks? No! Do we live like Greeks? No! Then how can we create an art like the Greeks?

Greek art was great because it was true to Greek life. Even Winckelmann realized that the Germans would have to live like the Greeks before they could create like Greeks. Then why did pseudo-classicism have such a strong hold on the Germany of Frederick the Great and Napoleonic France? What forces brought that glory to pseudo-classicism?

The forces that glorified pseudo-classicism were Frederick the Great and Napoleon. These two giants of politics influenced not only political movements. No political movements exist outside of the social world.

Frederick the Great aspired to become as great as Caesar, as Pericles. Can there be a surer way to become as Caesar than by surrounding oneself with the things that were Caesar's? The dignified and heroic classicism harmonized with Frederick's military achievements. Frederick's heroic struggle in the seven-year war was personified in the pseudo-classic sculpture and painting.

Napoleon's favorite artist, David, painted the Greek and Roman heroes with much dignity and austerity. Napoleon felt much nearer to a Greek hero than to a contemporary Frenchman.

The paintings of Boucher and Van Loo reflected too much the deposed Bourbons. The people were disgusted with anything that smacked of Louis XV. The superficial, artificial and licentious paintings of the Bourbon

Boucher and Van Loo looked weak and insipid next to the dignified austere pseudo-classicism of Napoleon's David. Bourbon and pseudo-classic art were social phenomena. The two schools of art differed just as much and in the same way that the forces which produced them differed.

Then came Romanticism, not only in art, but in life. The people tired of emperors. The successor of Frederick the Great, Frederick William, was not as wise as his predecessor. Napoleon was overthrown and the Bourbons were restored. The Napoleonic and counter-Napoleonic armies left Europe ravaged and exhausted. The land lay waste. The people were pessimistic and forlorn. Chaos reigned. Passionate individualists sprang up, pessimistic, fantastic. The artists of the romantic era like their fellowmen in other fields were erratic, sensuous, dramatic, often wild and unorganized. The art they produced expressed their temperaments and reflected their society.

In this environment, the people began to despise the classic austerity and dignity. The pseudo-Greek solidity and colorless statuesque paintings of the pseudo-classicists, such as David and Ingres became unpopular. The people began to despise the long, involved, dignified, formal speeches in the plays of Racine and Corneille. They tired of the pure melody of Hayden and Mozart.

They found pleasures in the dramatic, passionate, loosely painted, subjective paintings of Delacroix.

They were pleased by the passionate, dramatic and colorful plays of Alexander Dumas, and the youthful Victor Hugo.

They found joy in the orchestral compositions and the power of Beethoven and Wagner.

The tempo of the age, the struggle, the drama, and the pessimism were expressed in the arts.

In poetry, Leopardi expressed the romantic spirit in Italy. Pushkin and Lermontov, in Russia. Byron and the youthful Shelley and Keats, in England. DeMusset, in France; Heine, in Germany.

Romantic art was not independent of life. Romantic artists did not differ from their fellow men.

The rapid advance in science created a new trend in thought. Science gave birth to large-scale industry. Mass production caused a revolution in society. The industrial revolution created a spirit of realism. When society became realistic, art turned realistic. Because of the technical, scientific origin, the realism turned into organic realism. (Organic realism, often called naturalism, has no relationship to social realism.) Realism was a reaction to romanticism as romanticism was a reaction to neo-classicism.

In France, Flaubert and Zola revolutionized literature by writing realistic novels. The realistic paintings of Coubert and Doumier, which expressed the human struggle through realistic eyes, were becoming very popular. Dostoyevsky expressed the spirit of realism in his Russian novels.

There were still revolutionists, but now they were realistic revolutionists and not romantic idealists. A realistic society, a society of the machine, a growing industrial society could produce only a realistic art.

The impressionists expressed the tempo of the industrial era. The rapid

development of the machine produced a new tempo. Speed became a social characteristic. Spontaneity and speed are the main characteristics of Impressionism.

Impressionism is basically realism in a hurry. Impressionists created with the philosophy that nothing in life is static. That in painting a portrait the artist gets only an impression of the person in a certain mood. In painting a landscape the artist gets an impression of the scene in a certain light. The person changes as his mood changes, the landscape is not the same after the light is altered. Thus everything an artist does is a mere impression.

Expressionism was born after the philosophy of individualism became highly developed. Expressionism is the brother of the laissez-faire policy; both are social phenomena. To understand expressionism we must understand rugged individualism. All laissez-faire bankers and brokers and expressionist artists despise responsibility to society. Each of them is a rugged individualist doing everything to satisfy his own personal desire.

The expressionist artist does not create for society any more than the merchant goes into business in order to satisfy the needs or desire of the public. Just as the primary purpose of the merchant is to make profit, so the primary goal of the expressionist is to create for his own personal satisfaction. The public is considered by both merchants and expressionists only so far as it helps them achieve their ends.

Current art aims mainly at social subjects, at the contemporary scene. It expresses mainly group action, mass movement, class struggle, not individual characters. The artists of today seek to express mainly social realism, not organic realism or naturalism. They are not painting portraits of man, organically realistic, but are employing the form of man as a social symbol.

Benton, Rivera, Orozco, the outstanding painters of this day are not escapists, they do not sit in their attics and wait for inspiration. They are socially conscious, they study their society and interpret it, each in his own manner.

Artists who were entirely unrecognized have been raised to leadership because they paint the American scene. Significant, abstract form and subjective expression, outstanding characteristics of expressionism are no longer the main characteristics of art. The subject has become important. Exposition, not personal expression, is the predominant characteristic in art today. Illustration has again been raised to a dignified position. Most of our pictures tell stories as pictures did before expressionism. But now the stories told by art are neither classic nor romantic.

Artists before the depression migrated to Europe, escaped from the American scene. The depression, the fall of the dollar, brought the artists back and they must now paint their native environment. We have suddenly ceased to admire all of French art, and we have become very proud of our own art, which only a few years before we neglected, even despised.

European countries and America turned nationalistic, not only politically, not only economically, but also artistically. Art always goes where politics and economics go. The pres-

ent trend in American art is nationalistic.

"The American Scene" in art will undoubtedly last as long as the nationalist creed continues.

Art has always been influenced by social forces. Bourbon art expressed the court spirit of Louis XV: It was the expression of a decadent Royalty. Neo-classic art expressed the heroic spirit of Napoleon and Frederick the Great: It was an artificially stimulated pseudo culture. Romanticism was an expression of society in revolt: It was a revolt against all dictators, political, economic and academic. Realism was the result of scientific progress: It expressed the spirit of the Industrial Revolution. Impressionism was the result of the rapid development of the machine: It expressed the increased tempo of life. Expressionism reflected rugged individualism: It was the expression of bourgeois decadence. Present-day American art expresses the American scene: It is the expression of a socially conscious American people.

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DEPARTMENT OF BOOK REVIEWS

History of Manual and Industrial Education, 1870 to 1917. By *Charles Alphens Bennett.* The Manual Arts Press, Peoria, Illinois. 1937.

This volume, long awaited by students of industrial education throughout this country, appeared during the past summer. It is the second of a two-volume history, the first being *History of Manual and Industrial Education up to 1870.* These two books represent the results of many years of careful study by one of the best qualified men in the United States to write such a history. This volume, like the first, is both a history and a source book since much space is given to quotations of source materials upon which the text is built. It is, however, by no means merely a source book. Its chief value lies in the clear, concise accounts of events, of descriptions of the practices of important leaders and of presentations of their theories and the author's carefully drawn interpretations. It is a rich mine of historical material for the student of industrial education and for the student of education in general who wants to understand the origins and factors of growth of modern industrial education.

The author has written with restraint and great caution in his interpretations and evaluations of movements and developments. Indeed, one could wish that in the chapters dealing particularly with industrial arts in the United States he had given more of his own understanding of the interesting and significant changes and events, since he played so important a part in so many of them.

An obvious effort is made throughout to be accurate, impartial, and definite. In the author's own words: "In this, as in the earlier volume, an effort has been made to consult the best available sources and select facts that seem to be significant. In the selection, there has been no conscious effort to uphold any particular theory of manual or industrial education. Instead the aim has been to give facts and the opinions of men of recognized standing. The reader is left free to draw his own conclusions."

The book is a contribution of major importance to the literature of American education and will be an indispensable part of the professional library of every serious student of modern industrial education.—ARTHUR B. MAYS.

The Riddle of Napoleon. By *Raoul Brice.* Translated from the French by *Basil Creighton.* G. P. Putnam's Sons. New York. 1937. 331 pages. $3.75.

It is estimated that some 40,000 volumes have been written about the little Corsican whose star became visible on the horizon when, on the eve of the 13th of Vendemiaire, he ruthlessly poured case-shot into the insurgents who threatened the Convention and drove them from the steps of the church of St. Roch. The present volume, by a surgeon lieutenant-general in the French army, is a minute study of the heredity and the environmental factors that influenced the man who dominated Europe in those early years of the nineteenth century. Dr. Brice's book falls into three major parts. In the first he gives a magnificent epitome of the career of Bonaparte. Napoleon always spoke of his "star" and Dr. Brice sums up his political life under the headings, Dawn, Ascent, Zenith, Decline, and Extinction. The second section of the book treats of the great influences that moulded the "Corsican upstart." In great detail the author pictures Napoleon's origins, his psychological patterns, and his physical form. Dr. Brice emphasizes the effects of the Emperor's Corsican background, which he thinks has been too often ignored. The long vendetta against England was, in the author's opinion, a psychological compensation for having ostensibly cast off the Corsican. Dr. Brice spends many pages on the detailed analysis of the medical

evidence and he attempts to refute the theory that Napoleon died of cancer. The final major section is devoted to an examination of the influences exerted by Napoleon's own family — his four brothers, his sisters, Madame Mere, Josephine, and Marie Louise.

This treatment of Bonaparte is obviously the work of a competent medical man, an astute psychologist, and a student of military affairs. As such it deserves a high place among the 40,000 odd studies of the Emperor.—WILLIAM P. SEARS, JR., New York University School of Education.

A First Course in Education. By *Reeder.* Macmillan. 1937.

Education in a Democracy. By *Myers and Williams.* Prentice-Hall, Inc. 1937.

Every few weeks comes out a new book for a first course in education or as an introduction to education. The field now seems well supplied with such textbooks.

For whom are these books intended? If for freshmen in teacher training institutions, the supply of books is not too large; most of the books already issued seem ill adapted both in selection of material and in discussion to the freshman age and outlook. If for academic students who have had suitable preparation in mastering college studies and in use of the library, the supply of texts is now more than ample. Most of these texts regard an introduction to education as a skimming of the cream from the various departments of educational study, with a bibliography leading into more detailed study. Few of the texts have the public in mind, and yet one of the greatest needs of the day in the field of education is for the general public to have a better understanding of the processes of education and how the public is related to these processes.

Reeder's text is a scholarly work, in selection of material, in discussion, and in bibliographies. But it is too mature for the freshman and requires either good teaching to adapt it to the younger mind, or the experience and background of a year or more of college work. The order of topics is logical but not psychological for the immature student; Part V, the last in the book, on Education as a Profession, is of most interest to the new student. The book, like several others on the market, gives a bird's eye view of the various departments of education, and does it well; but in this reviewer's mind, after teaching an introduction course for several years, this is not the most effective kind of beginning course. A mature orientation course that views the whole field and dips into every part of it is less valuable than one that introduces one to the spirit and everyday work of the teacher, and allows time for visiting schools and seeing teaching in operation.

Myers and Williams have made a book more manageable for the new student and of more interest to the general reader. Had it a chapter on the relations of the public to the schools, it would have served well the general, non-college reader. But in this book, too, there is too much technical material. Note, for example, the discussion of contemporary schools of psychology under Structuralism, Functionalism, Behaviorism, Gestalt, Purposivism, Psychoanalysis. Why cannot authors of educational books be simpler and plainer in their use of educational terms? The inclusion in "Unit II" of names and achievements of many educational philosophers, earlier and later, makes this section a cyclopædia of names and facts; this might better wait for the detailed study of these philosophies in the students' later work. The names would then have real meaning to them. On the other hand the book contains much valuable material and with some re-selection and reorganization might be a very effective introduction to the study of education.

Practically all the new texts in Introduction give voluminous bibliographies but these lists would be far more useful if reduced substantially in size and annotated briefly so that the reader might have other guidance than his instructor in pursuing his reading. — ARTHUR H. WILDE, Boston University School of Education.

Modern Weights and Measures. By *Walter Renton Ingalls.* American Institute of Weights and measures, 33 Rector Street, New York. 1937. 72 pages and Index.

In twelve concise chapters the author exposes the pro-metric propaganda and its obvious fallacies. Adoption of the metric measures would not increase our foreign trade. Our automobiles, sewing machines, refrigerators, and farm machinery go to all parts of the world because they are superior products and reasonably priced. The fact that they are measured in inches or feet is no handicap. Belgian and German farmers know inches better than they know centimeters, thanks to the survival of old measures and the efforts of the International Harvester Company.

A fallacious argument often heard and accepted is that the learning of the metric system would save much school time and effort for our children. Experience in Europe lends no support to this argument. In progressive schools of Europe the metric tables are not taught, exactly as tables are not taught in America in the better schools. Metric measures are no simpler than customary units, and in general, customary units are better adapted to their purposes.

Furthermore, the experience of all other countries shows that customary measures do not disappear with compulsory adoption of metric. The total result, therefore, is to give children two systems to master, thus increasing the burdens of children with no corresponding benefits.

Compulsory imposition of the metric measures, with penalties against customary measures, would cost American industry millions of dollars immediately, with heavy expenditures for years. Dr. Ingalls estimates this as a staggering sum, running into billions.

But the greatest burden would be upon the thinking of the people. People cannot easily transform their thinking into new units. Napoleon, after 25 years of metric experience, chided his engineers for reporting to him in metric units. "Meters," said he, "who knows what meters mean? Give me the answer in yards!" Practically all adults of the present generation would continue to think in customary units and translate. Why not legislate a foreign language upon us? All told, it would be easier and much less expensive.

Who would benefit from adoption of metric measures? First, it would redound to French glory. "The conquest of the world for metric," is their slogan. Second, the makers of precision and recording machinery would benefit. Third, the politicians would add some thousands of inspectors to the Bureau of Standards.

Who would be discommoded and penalized? First of all and last, any of us who trade or think or pay taxes.

Dr. Ingalls supports his points by much interesting statistical and historical data. His monograph should be in every library and it should be widely read, particularly by editors, public speakers, and writers of resolutions for women's clubs and professional associations. — GUY M. WILSON, Boston University.

Our Racial and National Minorities. Edited by *Francis J. Brown* and *Joseph S. Roucek.* Prentice-Hall, Inc., New York. 1937. 877 pages. $5.00.

This is the most complete compendium that has yet appeared upon the subject of the various racial elements that have, in the course of the years, been fused together to create modern America. The editors have gathered together some forty contributors and the result is a significant contribution to the field of American sociology. This study aims to fill a threefold need; it includes practically all minority groups in sufficient detail to present the significant aspects and problems of each, yet concisely enough to include them all in a section of a single book; it not only includes the analysis of the impact of America's culture upon these minority groups but it also stresses the effect of their cultures upon America: finally, this is the first systematic treatment that combines both of the above with an inductive analysis of the social problems and conflicts arising from racial and cultural differentiation.

The editors look with serious doubt upon ruthless assimilation and the theory of the "melting pot." Instead, they point to a solution of the problem based upon a rich and functional community life and "cultural pluralism"—a ready understanding and cordial acceptance of the contributions made by minority groups to our corporate national life.

Our Racial and National Minorities is a splendid book of reference which ought to be on the shelves of all libraries as well as among the professional books of educators, ministers, and sociologists.—WILLIAM P. SEARS, JR., School of Education, New York University.

Mathematics in Life. By *Raleigh Schorling* and *John R. Clark*. The World Book Company, Yonkers-on-Hudson, New York. 1937. 437 pages. $1.40.

The traditional courses in high school mathematics have, for the most part, failed to contribute much of the practical to students. For generations high school boys and girls have labored over abstract mathematical busy work that neither challenged their intelligence nor assisted them in their socio-civic life. Except for those few that planned to go on in the fields of pure or applied science the mathematics courses have been simply vestiges of the defunct theory of formal discipline. To be sure most, if not all, of the elementary school mathematics might better be postponed until the final years of that stage of school life. In *Mathematics in Life* may be found a volume geared for high school students who are not planning to specialize in mathematics. A variety of techniques is used to interest the non-mathematically-minded boy or girl. There are many individual and group activities which this type of student will enjoy doing; there is ample provision for experiment, construction, investigation, and discussion. As a tool in guidance, too, this volume and the course which will be devised from it ought to be most helpful.

Mathematics in Life is an outstanding contribution. It will supply that minimum of practical mathematics for students of low mentality who wish to be developed not as computers but as human beings.—WILLIAM P. SEARS, JR., School of Education, New York University.

NEW EDUCATIONAL BOOKS

We acknowledge receipt of the following publications of interest to the readers of EDUCATION. Mention here does not preclude review in this or subsequent numbers of EDUCATION.

Secondary Education for Youth in Modern America. By *Harl R. Douglass*, Professor of Secondary Education, The University of Minnesota. A report to the American Youth Commission of the American Council on Education. 1937. American Youth Commission, Washington, D. C.

New Techniques in Social Science Teaching. A Case Book by *Vernon B. Hampton*, Ph.D., Litt.D., Director of The William Judson Hampton Memorial Teachers Institute of Staten Island, and Chairman of the Department of Social Science and English, Ralph R. McKee Vocational High School, New York City. Second Printing, March, 1937. $2.75. The John Willig Press, Inc., Stapleton, N. Y.

Reorganizing the Social Studies. A Survey by *Vernon B. Hampton*, Ph.D., Litt.D., as above. $1.25. The John Willig Press.

The Junior High School. A Psychological Approach. By *Ralph W. Pringle*, Professor of Education, Illinois State Normal University. The McGraw-Hill Series in Education. 1937. $3.00. McGraw-Hill Book Company.

Science in the Elementary School, Including an Activity Program. By *W. C. Croxton*, Ph.D., State Teachers College, St. Cloud, Minnesota. 1937. $3.00. McGraw-Hill Book Company.

Creative Group Education. By *S. R. Slavson*, Lecturer in Education, School of Education, New York University. 1937. $2.50. The Association Press.

Students and Occupations. By *E. G. Williamson*, Assistant Professor of Psychology and Director of the University Testing Bureau, The University of Minnesota. 1937. $2.50. Henry Holt and Company.

Reading Interests, Activities, and Opportunities of Bright, Average and Dull Children. By *May Lazar*, Ph.D. 1937. $1.60. Bureau of Publications, Teachers College, Columbia University.

Pupil Progress Policies and Practices. By *Garth H. Akridge*, Ph.D. 1937. $1.60. Bureau of Publications, Teachers College, Columbia University.

A Survey and Evaluation of the Education of School Music Teachers in the United States. By *Edna McEachern*, Ph. D. 1937. $1.85. Bureau of Publications, Teachers College, Columbia University.

The Road to Reunion, 1865-1900. By *Paul H. Buck*, Assistant Professor of History at Harvard University. 1937. $3.25. Little, Brown & Company.

The Presence of Everett Marsh. By *Playsted Wood*. 1937. 387 pp., cloth, $2.50. The Bobbs-Merrill Company.

The Story of Ancient Times. By *C. H. McClure*, Ph.D., *Charles C. Scheck* and *W. W. Wright*, Ph.D., illustrated by *Ben Carlton Mead*. In the Series, Our Developing Civilization, a series of Social Studies Textbooks Based on History. 338 pp., cloth, illustrated in color. 1937. List, $1.00. Laidlaw Brothers.

A Full-Grown Nation. By *Edna McGuire*, Elementary School Supervisor, East Chicago, Indiana. With Pictures by *George M. Richards*. 1937. List $1.28. The Macmillan Company.

Washington: City and Capital. American Guide Series. By Federal Writers' Project. Works Progress Administration. 1937. $3.00. Government Printing Office.

An Introduction to Public School Relations. By *Ward G. Reeder*, Professor of Education, Ohio State University. 1937. $2.25. The Macmillan Company.